TOSHIBA

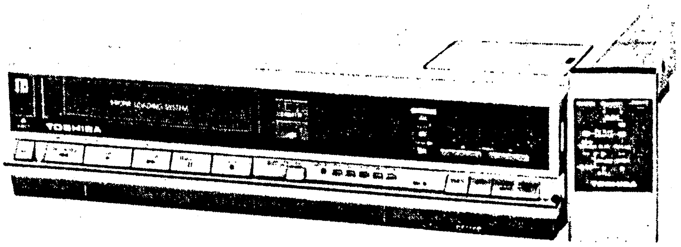
COLOR VIDEO CASSETTE RECORDER

V-M42/C

SERVICING DIAGRAMS

(V-M422,423,V-600C,AH-350)

Adjustment procedures are the same as those for the V-M41 chassis. For information on the adjustment procedures, refer to the manual for the V-M41 (FILE No. 030-093-4).



SPECIFICATIONS

GENERAL

Video recording system:	Rotary two-head helical scanning
Head configuration:	2-head rotary (HEAD: A, B)
Video signal:	EIA standard NTSC color
Storage temperature:	−20°C to +60°C (−4°F to +140°F)
Operating temperature:	5°C to 40°C (41°F to 104°F)
Antenna:	75-ohms external antenna terminal for VHF 300-ohms external antenna terminal for UHF
Channel coverage:	VHF channels 2−13 UHF channels 14−83 CATV channels A2, A1, A−I, J−W, AA−JJ
VHF output signal:	Channel 3 or 4 (selectable) 75-ohms unbalanced

SWITCH POSITION	CHANNEL
VL ch	2−6
VH ch	A2, A1, A−I, 7−13
U ch	14−83
CATV ch	J−W, AA−JJ

Power consumption	32W (8W with power off)
Weight:	7.7 kg
Dimensions:	420 × 105 × 382 mm (W × H × D)

VIDEO

Input:	VIDEO LINE IN: Pin jack-type connector 1,0V (p-p) 75-ohms unbalanced, sync. negative

VIDEO

Output:	VIDEO LINE OUT: Pin jack-type connector 1.0V (p-p) 75-ohms unbalanced, sync. negative
Signal to noise ratio:	Better than 45 dB

AUDIO

Input:	AUDIO LINE IN: Pin jack-type, 47k-ohms, −10 dBs
Output:	AUDIO LINE OUT: Pin jack-type, less than 10k-ohms, −7 dBs, unbalanced (load: more than 47k-ohms)
Frequency response:	[βII]: 50 Hz to 8 KHz [βIII]: 50 Hz to 7 KHz
Signal to noise ratio:	Better than 40 dB
Audio distortion:	Less than 4% at 400 Hz

TAPE TRANSPORT

Tape speed:	βII 20 mm/sec., βIII 13.3 mm/sec.
Maximum recording time:	300 min. with Toshiba L-830 tape (βIII mode)
Fast forward time:	Within 4.5 min. (L-500)
Rewind time:	Within 4.5 min. (L-500)

TIMER

Fluorescent digital display
Count down from AC line frequency.

Remote Control Unit

11 key: 15 modes. Infrared Remote Control Operation

Design and specifications are subject to change without notice.

Caution: The unauthorized recording of television programmes and other materials may infringe on the rights of others.

SAFETY NOTICE

SAFETY PRECAUTIONS

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 ohms per volt or more sensitivity.

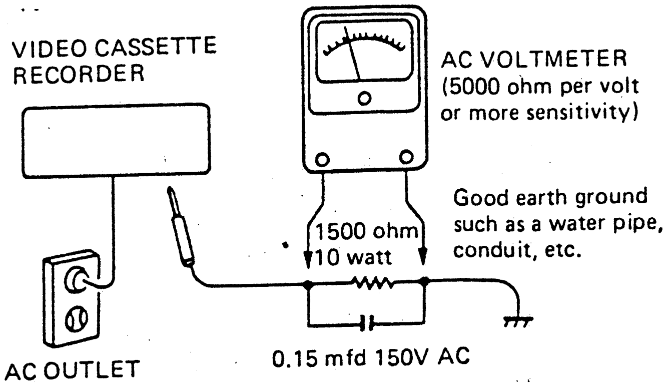
Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet, screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500 ohm resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 volts. A reading exceeding 0.3 volts indicates that a dangerous potential exists, the fault must be located and corrected.

Repeat the above test with the VCR power plug reversed.

NEVER RETURN A VCR TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.

READING SHOULD NOT EXCEED 0.3V

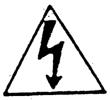

VIDEO CASSETTE RECORDER
AC VOLTMETER (5000 ohm per volt or more sensitivity)
Good earth ground such as a water pipe, conduit, etc.
1500 ohm 10 watt
AC OUTLET
0.15 mfd 150V AC

Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check

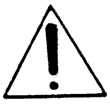
CAUTION

RISK OF ELECTRIC SHOCKS
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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1. Inspection Flow Chart

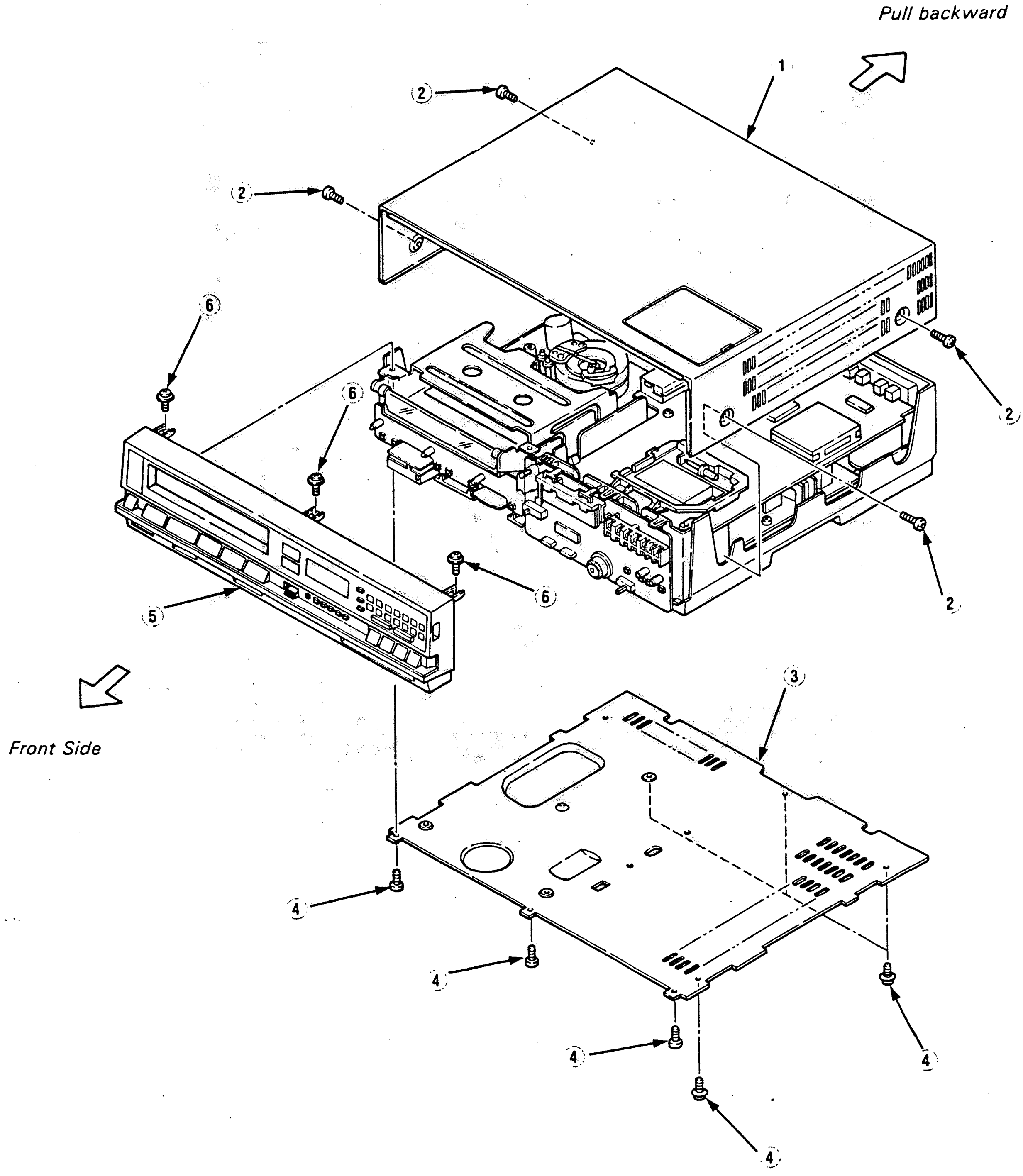
Operation Steps		Items to be confirmed	Inspection block diagram	Page
1. AC Plug-in	Time adjustment	Clock display	Power supply block (AC line system)	11
	Program timer setting	Clock setting operation	Timer counter block	16
2. Power SW ON	TV/VCR SW (to VCR)	Indication lamp	Power supply block (DC line system)	11
	Channel selector operation, AFT operation	TV receiving condition	System control	31
	EE picture quality	CH select, AFT operation level	PIF and channel selector block	25
	EE sound quality	EE picture quality/ signal level	Video (EE, REC mode)	53
	TV/VCR SW (to TV)	EE sound quality/ signal level	Audio (EE, REC mode)	65
3. Cassette In/Out	Cassette-in	FL mechanism operation	Mechanism and system control block	31~36
	Tape loading	Loading operation		
	Eject Tape unloading Cassette-out	Eject operation Indication lamp Abnormal noises		
4. Key entry operation (Remote control)	Playback, recording	Indication lamp	Mechanism and system control block	31~36
	Cue/Review	Operation of each mode (tape drive operation) Abnormal noises	Remote control block	71
	Still/slow			
	FF/REW			
5. Playback performance (picture quality, audio quality, etc.)	Playback (Test tape ßII/ßIII) Cue/Review/Stop/Slow	Resolution, S/N Hue, saturation, color uneveness, color dropout Audio distortion, level variation, picture noise, picture vertical bends, picture horizontal bends, skew distortion, Flicker, beat	Video playback system Audio playback system	56 66
6. Recording/ Playback performance (picture quality, audio quality, etc.)	Recording/Playback performance	Resolution, S/N Hue, saturation, color uneveness, color dropout Audio distortion, level variations, picture noise, vertical bends, picture horizontal bends, skew distortion, flicker, beat.	Video recording system Audio recording system	53 65

How to use the table

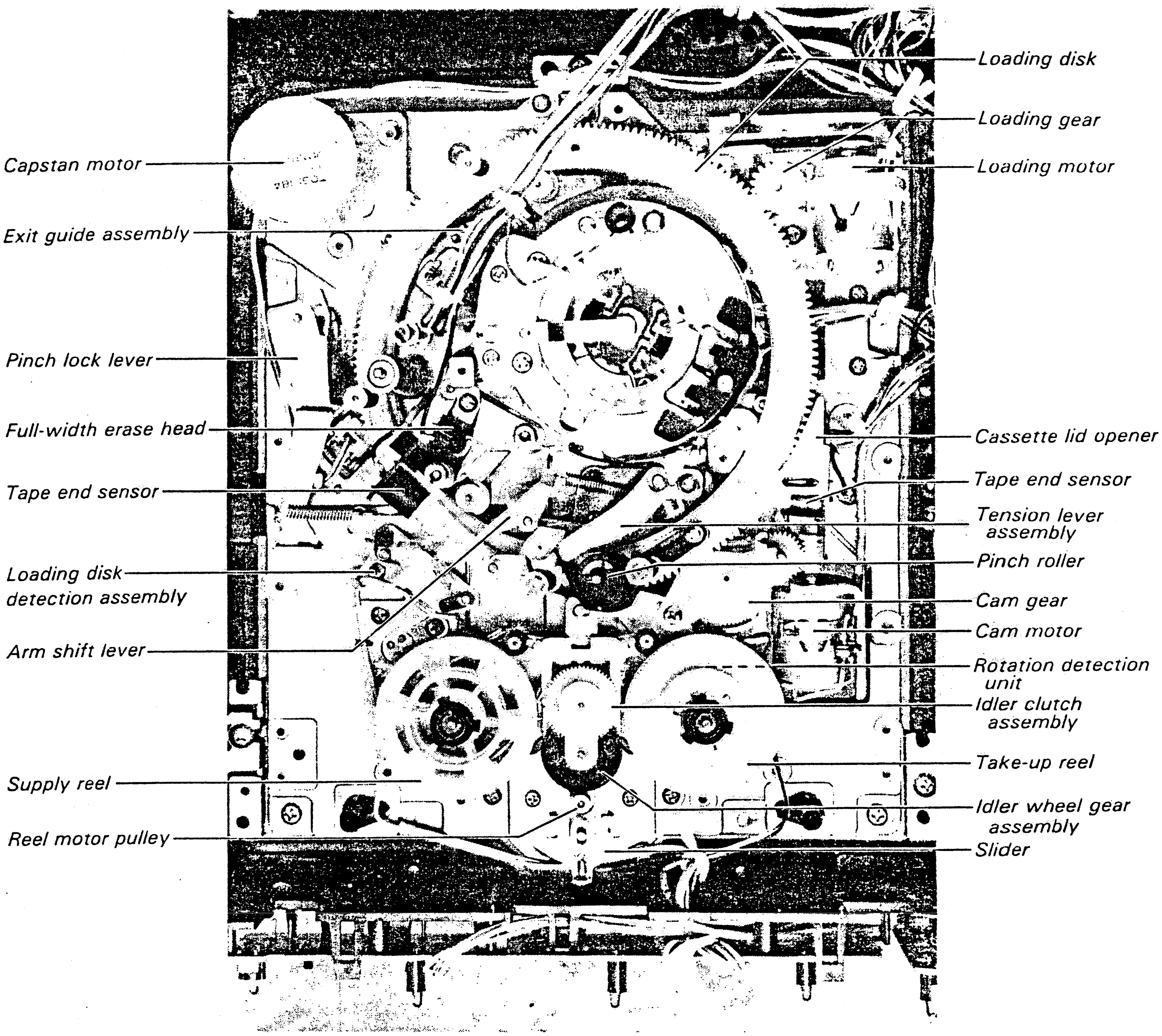
1. When inspecting a defective VCR, proceed according to the steps shown in the table.
2. Check the items to be confirmed for each operation step.
3. If a problem is found on the item, check waveforms (level) referring to the block diagram relating to the items.
4. PC board pattern diagram and schematic diagram are prepared in a page following the block diagram. Use them to examine the circuit precisely.
5. After completion of the repair work, check steps 1 to 6 again.

2. Removal of Cabinet

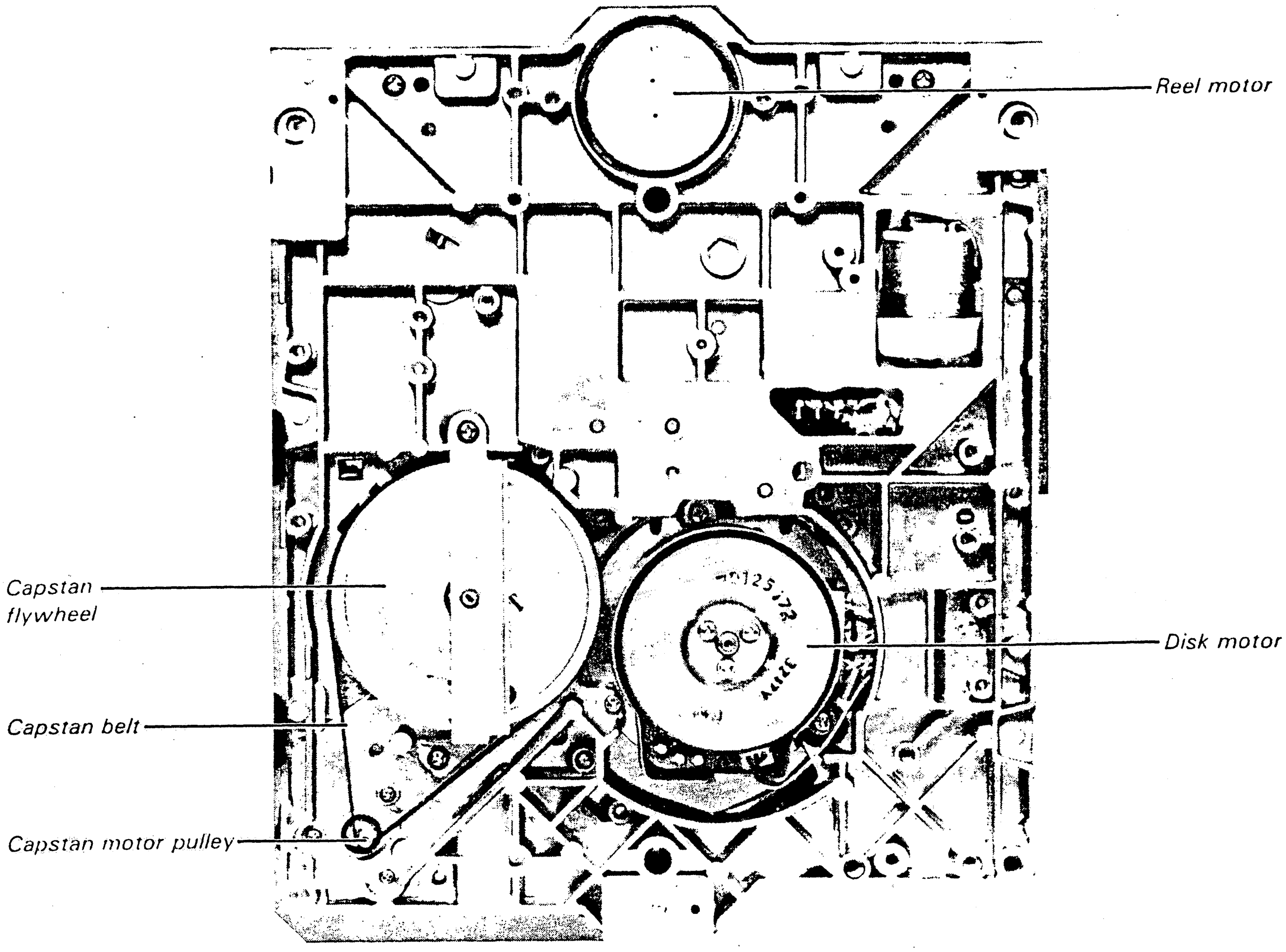
(1) Disconnect power cord plug from AC outlet.
(2) Remove 4 screws ② securing top cover ①.
(3) Remove the top cover ① by sliding it backward.
(4) Remove 7 screws ④ securing bottom cover ③, then remove the bottom cover.
(5) Remove 3 screws ⑥ securing front panel ⑤.
(6) Remove the front panel ⑤.


Pull backward
①
②
②
②
②
⑥
⑥
⑥
⑤
③
④
④
④
④
④
Front Side

3. Mechanical Parts Location Diagram

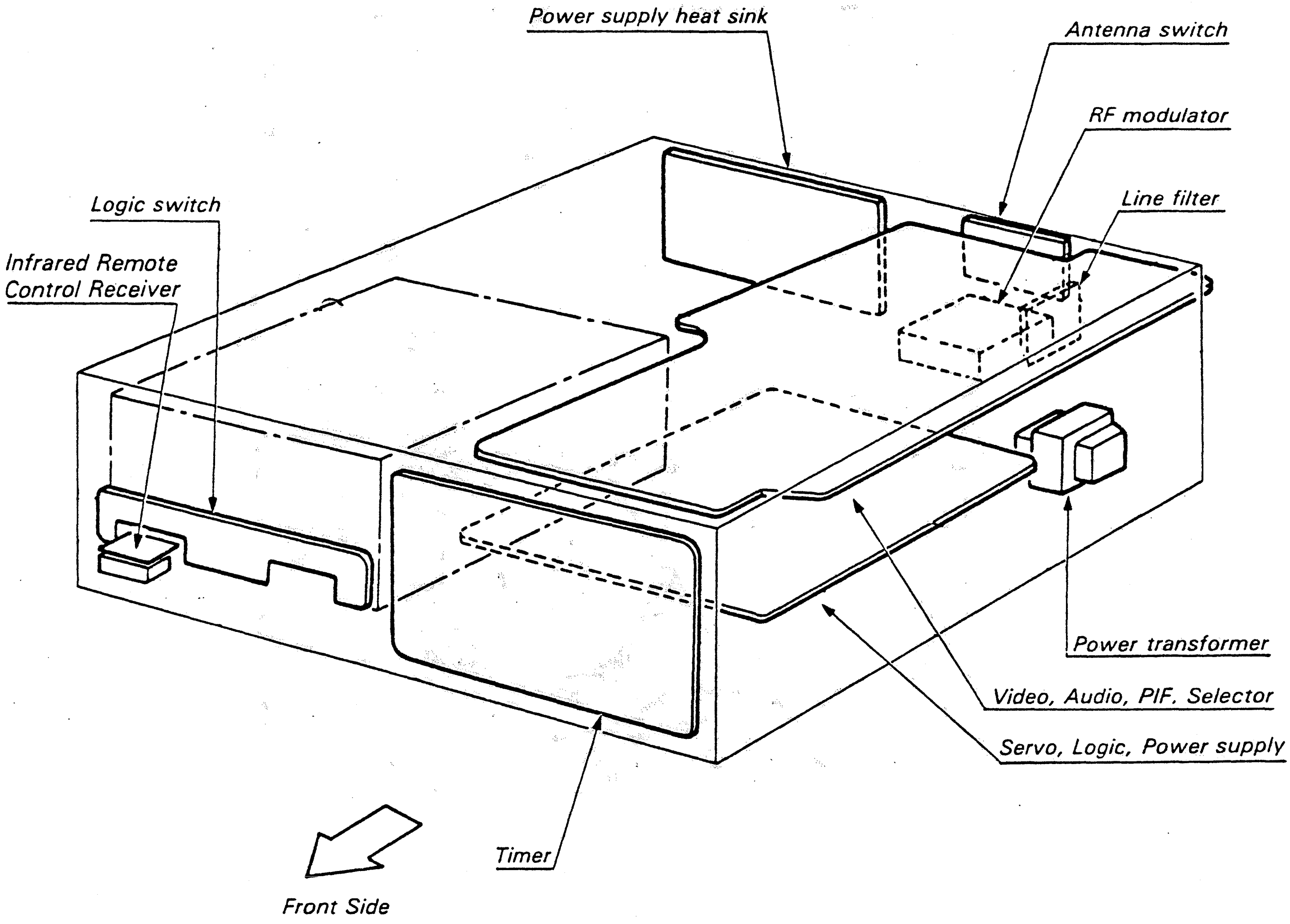

Loading disk
Loading gear
Loading motor
Capstan motor
Exit guide assembly
Pinch lock lever
Full-width erase head
Cassette lid opener
Tape end sensor
Tape end sensor
Tension lever assembly
Loading disk detection assembly
Pinch roller
Cam gear
Cam motor
Arm shift lever
Rotation detection unit
Idler clutch assembly
Take-up reel
Supply reel
Idler wheel gear assembly
Reel motor pulley
Slider

Top view


Reel motor
Capstan flywheel
Disk motor
Capstan belt
Capstan motor pulley

Bottom View

4. Electrical Units Location Diagram

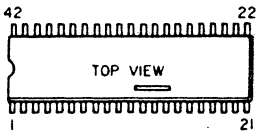
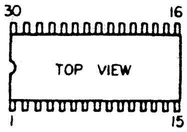
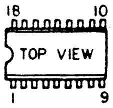
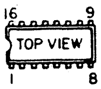
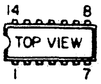
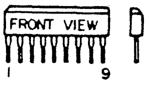
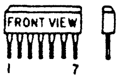
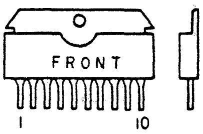

Power supply heat sink
Antenna switch
RF modulator
Line filter
Logic switch
Infrared Remote Control Receiver
Power transformer
Video, Audio, PIF, Selector
Servo, Logic, Power supply
Timer
Front Side

5. Part Configuration and their Symbols

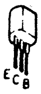
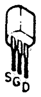
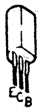
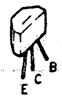
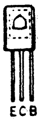
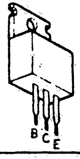
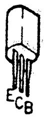
NOTE: Precautions for Part Replacement

- In the schematic diagram, parts marked ⚠ (ex. R810) are critical parts to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
- Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire, etc.

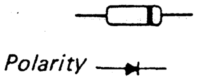
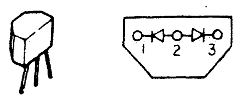
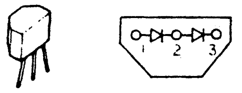
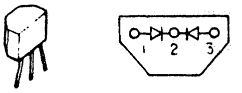
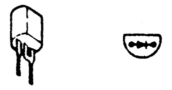
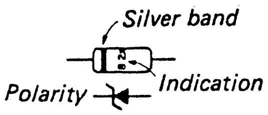
1. IC's

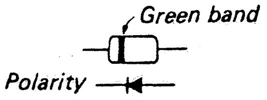
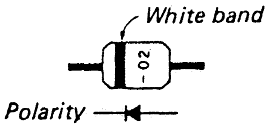
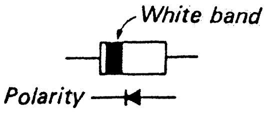
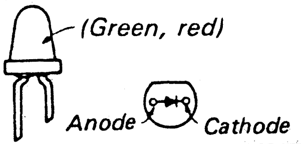
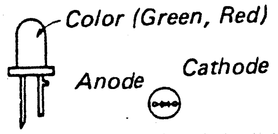
Name	Shape
TA7788P, TD6314P-01 TMP6320-6358Y TMP4320-6391Y TCP4633-9822X	 42 22 TOP VIEW 1 21
TA7788AP TA7744P	 30 16 TOP VIEW 1 15
TA7743P	 18 10 TOP VIEW 1 9
TA7607AP, TA7742P TA7740P, TL8610P TC4028BP, TD62504P SN7442AN	 16 9 TOP VIEW 1 8
TA75902P TA7741P	 14 8 TOP VIEW 1 7
TA7337P, TA7365P μPC1474HA TA7325P, TA7351P TA75393S	 FRONT VIEW 1 9
TA7361P	 FRONT VIEW 1 7
TA7277AP	

2. Transistors

Name	Shape
2SA562TM-Y 2SC1959-Y 2SC1815-Y 2SA1015-Y 2SC388ATM	
2SK30ATM-Y	
2SA966-Y 2SC2236-Y	
2SA1048-Y, 2SC2458-Y RN1201, RN1202 RN1203, RN1204 RN2201, RN2202 RN2203	
2SD549	
2SB435-Y 2SD880-Y	
PST520C	

3. Diode

Name	Shape
1S1554(TV) 1S1555(TV)	
1SS200	
1SS227	
1SS201	
μPC574J	
05Z8.2-X, 05Z5.6-Z 05Z3.9-Z, 05Z3.6-Z 05Z4.7-Y, 05Z12-Y 05Z5.1-X	 Silver band Polarity Indication

Name	Shape
1SS176	 Green band Polarity
ERC01-02FL	 White band -02 Polarity
ERA12-02	 White band Polarity
TLUG163 TLOR163	 (Green, red) Anode Cathode
TLG113A TLR113A	 Color (Green, Red) Anode Cathode

4. Solid resistor indication

Resistor	1/8W film	P type film	U type film	Solid	Oxide film	Metal film	Cement	Fuse
Symbol	None	P	U	S	R	W	W	RF

Tolerance	±2%	±5%	±10%	±20%
Symbol	G	J	None	None

- All film type and oxide film type resistors used are ±5%, so the tolerance symbol was not indicated for them.

5. Capacitor indication

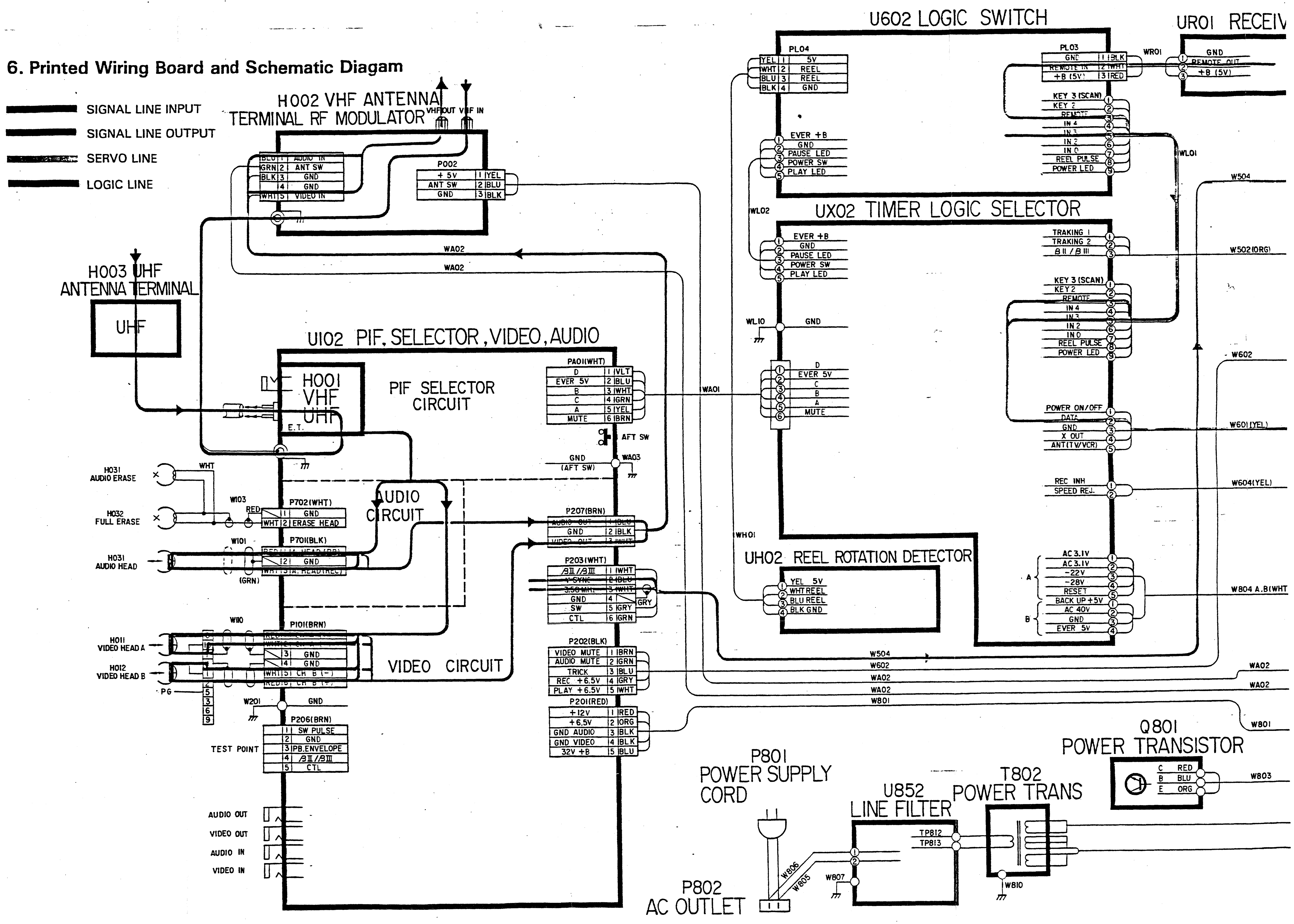
Description	Symbol	Capacitance, unit	Capacitance allowance
Electrolytic	+⊣⊢	μF	Not indicated
Special electrolytic			Indicated
Plastic film	⊣⊢	μF: indicated with numbers below decimal point PF: indicated with numbers over decimal point	Indicated below ±5% (J), indicated over ±0.5% PF, not indicated for others
Ceramic			
Trimmer	⊣↗⊢	PF	Not indicated

(Note) No working voltage is indicated for capacitors rated at 50V except electrolytic capacitors.

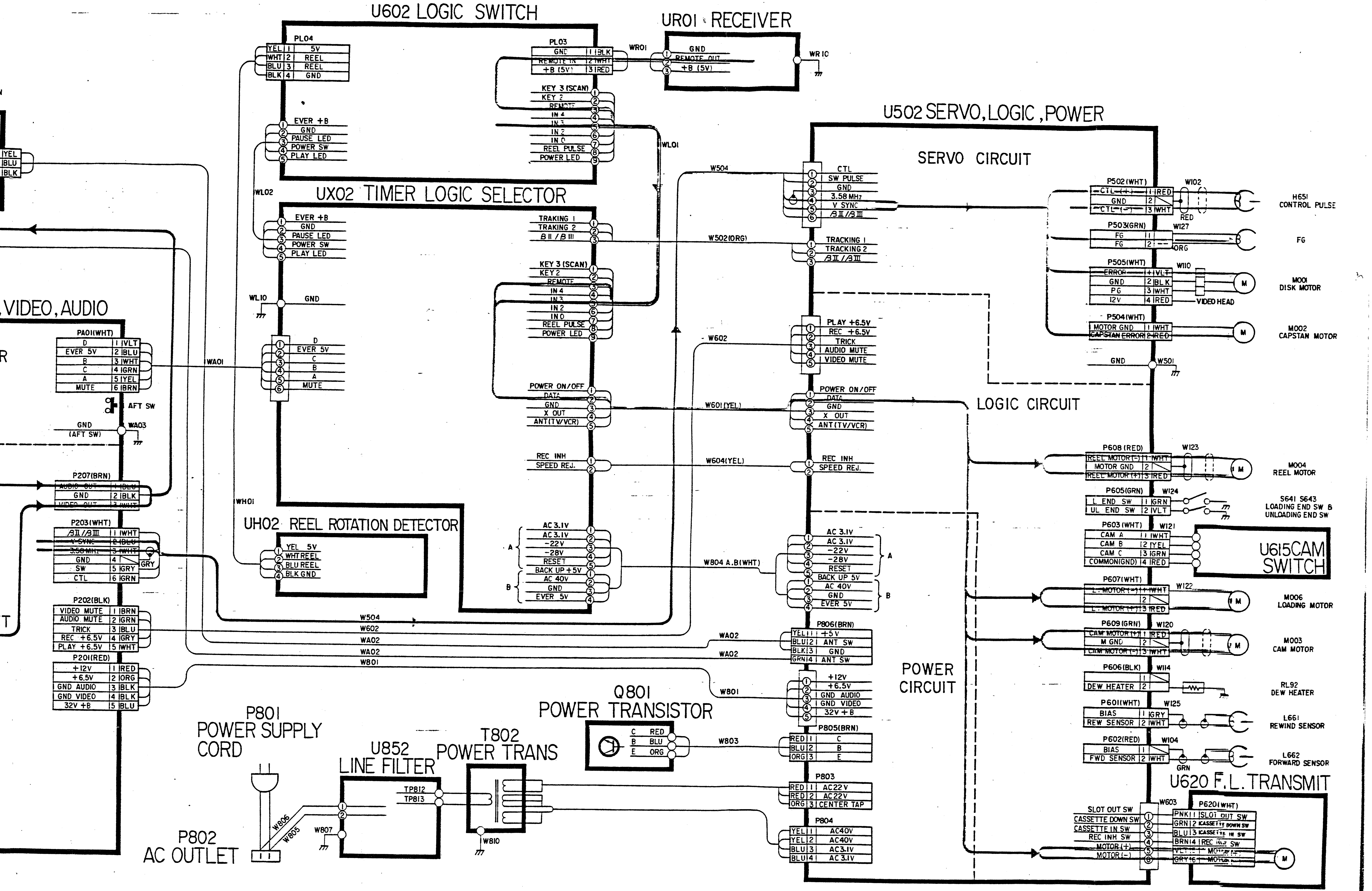
6. Waveform and voltage measurement

- Measurement of waveform and voltage at each section in the color circuits was conducted with sufficient service color bar signal being received and reproduced in normal conditions.
- Waveforms and voltage values for the remaining circuit were measured with a broadcasting signal normally received, so they may vary slightly according to the programs being received. Use then as a measure for servicing.
- All voltage values except the waveforms were DC voltages and measured by a digital voltmeter.

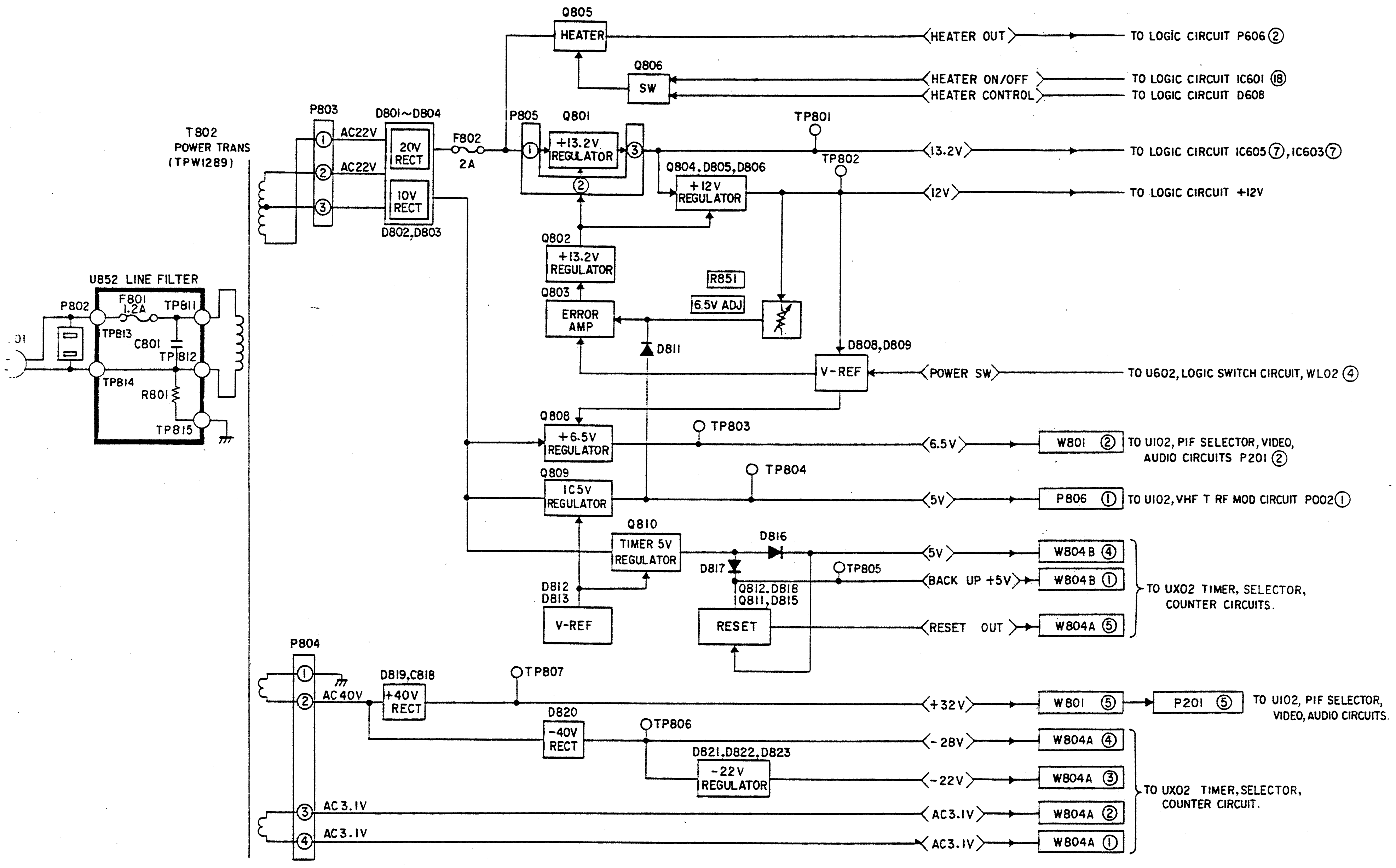
6. Printed Wiring Board and Schematic Diagam



SIGNAL LINE INPUT
SIGNAL LINE OUTPUT
SERVO LINE
LOGIC LINE
H002 VHF ANTENNA TERMINAL RF MODULATOR
VHF OUT
VHF IN
BLU 1 AUDIO IN
GRN 2 ANT SW
BLK 3 GND
4 GND
WHT 5 VIDEO IN
P002
+5V 1 YEL
ANT SW 2 BLU
GND 3 BLK
WA02
H003 UHF ANTENNA TERMINAL
UHF
U102 PIF, SELECTOR, VIDEO, AUDIO
H001 VHF UHF
E.T.
PIF SELECTOR CIRCUIT
PA01(WHT)
D 1 VLT
EVER 5V 2 BLU
B 3 WHT
C 4 GRN
A 5 YEL
MUTE 6 BRN
AFT SW
GND (AFT SW)
WA03
H031 AUDIO ERASE
H032 FULL ERASE
H031 AUDIO HEAD
WHT
W103
RED
P702(WHT)
1 GND
WHT 2 ERASE HEAD
W101
P701(BLK)
2 GND
(GRN)
AUDIO CIRCUIT
P207(BRN)
AUDIO OUT 1 BLU
GND 2 BLK
VIDEO OUT 3 WHT
P203(WHT)
βII/βIII 1 WHT
V-SYNC 2 BLU
3.58 MHz 3 WHT
GND 4
SW 5 GRY
CTL 6 GRN
GRY
W110
P101(BRN)
H011 VIDEO HEAD A
H012 VIDEO HEAD B
3 GND
4 GND
WHT 5 CH B (−)
RED 6 CH B (+)
PG
VIDEO CIRCUIT
W201
GND
P206(BRN)
1 SW PULSE
2 GND
3 PB.ENVELOPE
4 βII/βIII
5 CTL
TEST POINT
AUDIO OUT
VIDEO OUT
AUDIO IN
VIDEO IN
P202(BLK)
VIDEO MUTE 1 BRN
AUDIO MUTE 2 GRN
TRICK 3 BLU
REC +6.5V 4 GRY
PLAY +6.5V 5 WHT
P201(RED)
+12V 1 RED
+6.5V 2 ORG
GND AUDIO 3 BLK
GND VIDEO 4 BLK
32V +B 5 BLU
WA01
U602 LOGIC SWITCH
PL04
YEL 1 5V
WHT 2 REEL
BLU 3 REEL
BLK 4 GND
EVER +B
GND
PAUSE LED
POWER SW
PLAY LED
PL03
GND 1 BLK
REMOTE IN 2 WHT
+B (5V) 3 RED
KEY 3 (SCAN)
KEY 2
REMOTE
IN 4
IN 3
IN 2
IN 0
REEL PULSE
POWER LED
WR01
UR01 RECEIV
GND
REMOTE OUT
+B (5V)
WL01
W504
WL02
UX02 TIMER LOGIC SELECTOR
TRAKING 1
TRAKING 2
βII/βIII
W502(ORG)
WL10
GND
D
EVER 5V
C
B
A
MUTE
W602
POWER ON/OFF
DATA
GND
X OUT
ANT(TV/VCR)
W601(YEL)
REC INH
SPEED REJ.
W604(YEL)
WH01
UH02 REEL ROTATION DETECTOR
YEL 5V
WHT REEL
BLU REEL
BLK GND
AC 3.1V
AC 3.1V
−22V
−28V
RESET
BACK UP +5V
AC 40V
GND
EVER 5V
A
B
W804 A.B(WHT)
W504
W602
WA02
WA02
W801
W801
Q801 POWER TRANSISTOR
C RED
B BLU
E ORG
W803
P801 POWER SUPPLY CORD
U852 LINE FILTER
T802 POWER TRANS
TP812
TP813
W806
W805
W807
W810
P802 AC OUTLET

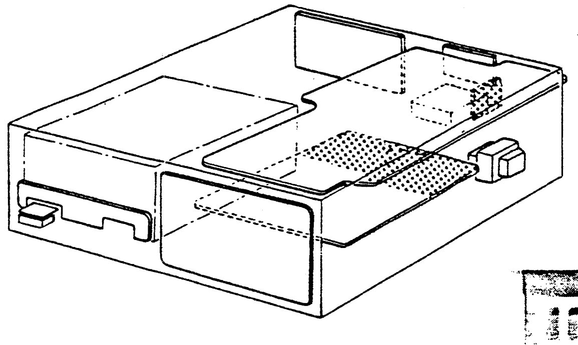

U602 LOGIC SWITCH
PL04
YEL 1 5V
WHT 2 REEL
BLU 3 REEL
BLK 4 GND
PL03
GND 1 BLK
REMOTE IN 2 WHT
+B (5V) 3 RED
WR01
UR01 RECEIVER
GND
REMOTE OUT
+B (5V)
WR1C
KEY 3 (SCAN)
KEY 2
REMOTE
IN 4
IN 3
IN 2
IN 0
REEL PULSE
POWER LED
EVER +B
GND
PAUSE LED
POWER SW
PLAY LED
WL01
WL02
UX02 TIMER LOGIC SELECTOR
TRAKING 1
TRAKING 2
βII / βIII
WL10
GND
D
EVER 5V
C
B
A
MUTE
POWER ON/OFF
DATA
GND
X OUT
ANT (TV/VCR)
REC INH
SPEED REJ.
WH01
UH02 REEL ROTATION DETECTOR
YEL 5V
WHT REEL
BLU REEL
BLK GND
AC 3.1V
AC 3.1V
-22V
-28V
RESET
BACK UP +5V
AC 40V
GND
EVER 5V
A
B
U502 SERVO, LOGIC, POWER
SERVO CIRCUIT
LOGIC CIRCUIT
POWER CIRCUIT
W504
CTL
SW PULSE
GND
3.58 MHz
V SYNC
βII / βIII
W502 (ORG)
TRACKING 1
TRACKING 2
βII / βIII
W602
PLAY +6.5V
REC +6.5V
TRICK
AUDIO MUTE
VIDEO MUTE
W601 (YEL)
POWER ON/OFF
DATA
GND
X OUT
ANT (TV/VCR)
W604 (YEL)
REC INH
SPEED REJ.
W804 A.B (WHT)
AC 3.1V
AC 3.1V
-22V
-28V
RESET
BACK UP 5V
AC 40V
GND
EVER 5V
P806 (BRN)
YEL 1 +5V
BLU 2 ANT SW
BLK 3 GND
GRN 4 ANT SW
WA02
WA02
W801
+12V
+6.5V
GND AUDIO
GND VIDEO
32V +B
P805 (BRN)
RED 1 C
BLU 2 B
ORG 3 E
W803
P803
RED 1 AC22V
RED 2 AC22V
ORG 3 CENTER TAP
P804
YEL 1 AC40V
YEL 2 AC40V
BLU 3 AC3.1V
BLU 4 AC3.1V
Q801 POWER TRANSISTOR
C RED
B BLU
E ORG
P801 POWER SUPPLY CORD
P802 AC OUTLET
W806
W805
W807
U852 LINE FILTER
TP812
TP813
T802 POWER TRANS
W810
P502 (WHT)
CTL (+) 1 RED
GND 2
CTL (-) 3 WHT
W102
RED
H651 CONTROL PULSE
P503 (GRN)
FG 1
FG 2
W127
ORG
FG
P505 (WHT)
ERROR 1 VLT
GND 2 BLK
PG 3 WHT
12V 4 RED
W110
VIDEO HEAD
M001 DISK MOTOR
P504 (WHT)
MOTOR GND 1 WHT
CAPSTAN ERROR 2 RED
M002 CAPSTAN MOTOR
GND
W501
P608 (RED)
REEL MOTOR (-) 1 WHT
MOTOR GND 2
REEL MOTOR (+) 3 RED
W123
M004 REEL MOTOR
P605 (GRN)
L END SW 1 GRN
UL END SW 2 VLT
W124
S641 S643 LOADING END SW & UNLOADING END SW
P603 (WHT)
CAM A 1 WHT
CAM B 2 YEL
CAM C 3 GRN
COMMON (GND) 4 RED
W121
U615 CAM SWITCH
P607 (WHT)
L MOTOR (-) 1 WHT
2
L MOTOR (+) 3 RED
W122
M006 LOADING MOTOR
P609 (GRN)
CAM MOTOR (+) 1 RED
M GND 2
CAM MOTOR (-) 3 WHT
W120
M003 CAM MOTOR
P606 (BLK)
1
DEW HEATER 2
W114
RL92 DEW HEATER
P601 (WHT)
BIAS 1 GRY
REW SENSOR 2 WHT
W125
L661 REWIND SENSOR
P602 (RED)
BIAS 1
FWD SENSOR 2 WHT
W104
GRN
L662 FORWARD SENSOR
U620 F.L. TRANSMIT
W603
P620 (WHT)
SLOT OUT SW
CASSETTE DOWN SW
CASSETTE IN SW
REC INH SW
MOTOR (+)
MOTOR (-)
PNK 1 SLOT OUT SW
GRN 2 CASSETTE DOWN SW
BLU 3 CASSETTE IN SW
BRN 4 REC INH SW
YEL 5 MOTOR (+)
GRY 6 MOTOR (-)
M
VIDEO, AUDIO
YEL
BLU
BLK
PA01 (WHT)
D 1 VLT
EVER 5V 2 BLU
B 3 WHT
C 4 GRN
A 5 YEL
MUTE 6 BRN
WA01
AFT SW
GND (AFT SW)
WA03
P207 (BRN)
AUDIO OUT 1 BLU
GND 2 BLK
VIDEO OUT 3 WHT
P203 (WHT)
βII / βIII 1 WHT
V SYNC 2 BLU
3.58 MHz 3 WHT
GND 4
SW 5 GRY
CTL 6 GRN
GRY
P202 (BLK)
VIDEO MUTE 1 BRN
AUDIO MUTE 2 GRN
TRICK 3 BLU
REC +6.5V 4 GRY
PLAY +6.5V 5 WHT
P201 (RED)
+12V 1 RED
+6.5V 2 ORG
GND AUDIO 3 BLK
GND VIDEO 4 BLK
32V +B 5 BLU
W504
W602
WA02
WA02
W801
R
T

7. Power Supply Block Diagram

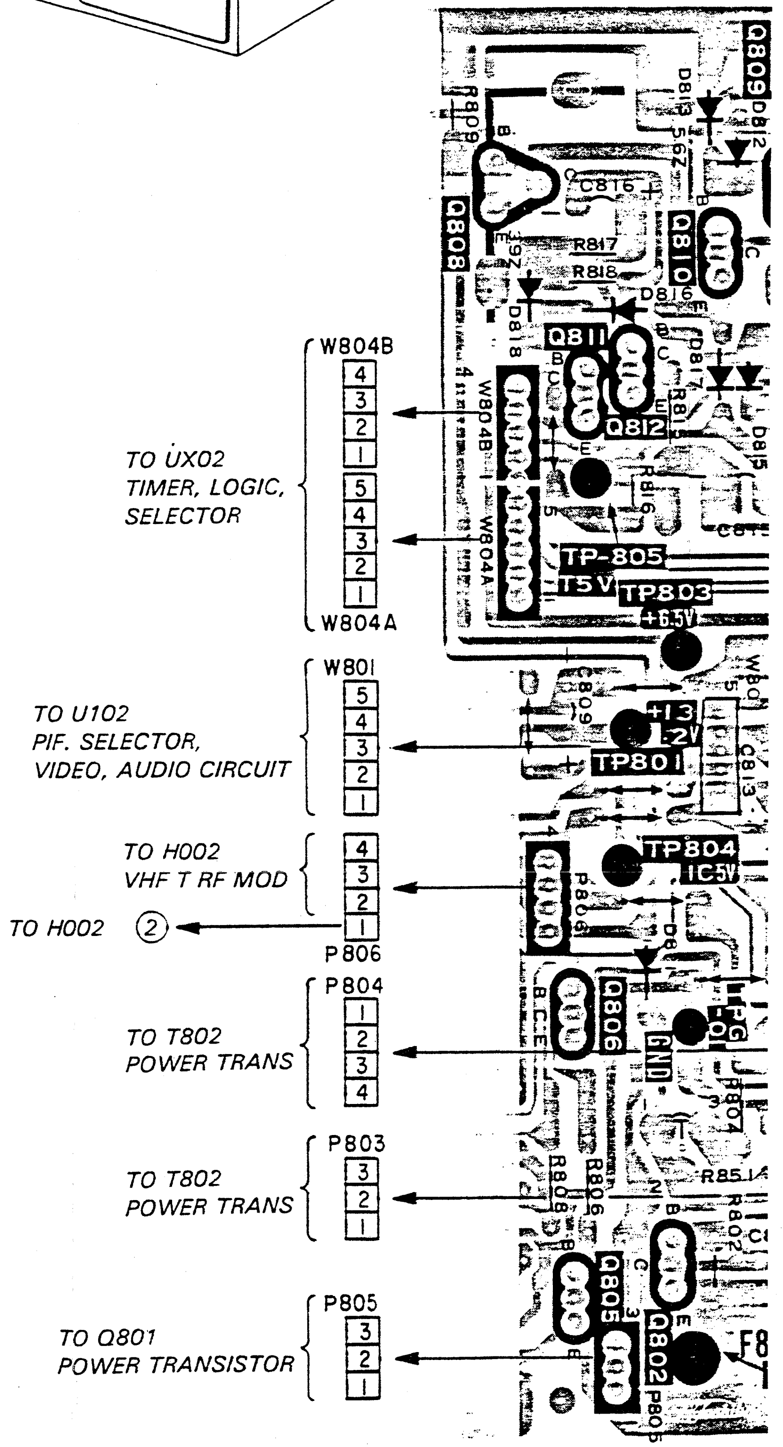


Q805
HEATER
HEATER OUT
TO LOGIC CIRCUIT P606 ②
Q806
SW
HEATER ON/OFF
HEATER CONTROL
TO LOGIC CIRCUIT IC601 ⑱
TO LOGIC CIRCUIT D608
T802
POWER TRANS
(TPW1289)
P803
AC22V
AC22V
D801~D804
20V RECT
10V RECT
D802,D803
F802
2A
P805
Q801
+13.2V REGULATOR
TP801
13.2V
TO LOGIC CIRCUIT IC605⑦, IC603⑦
Q804, D805, D806
+12V REGULATOR
TP802
12V
TO LOGIC CIRCUIT +12V
Q802
+13.2V REGULATOR
Q803
ERROR AMP
R851
6.5V ADJ
D811
D808, D809
V-REF
POWER SW
TO U602, LOGIC SWITCH CIRCUIT, WL02 ④
U852 LINE FILTER
P802
F801
1.2A
TP811
TP813
C801
TP812
TP814
R801
TP815
Q808
+6.5V REGULATOR
TP803
6.5V
W801 ②
TO U102, PIF SELECTOR, VIDEO, AUDIO CIRCUITS P201 ②
Q809
IC5V REGULATOR
TP804
5V
P806 ①
TO U102, VHF T RF MOD CIRCUIT P002①
Q810
TIMER 5V REGULATOR
D816
D817
5V
W804B ④
TP805
BACK UP +5V
W804B ①
D812
D813
Q812, D818
Q811, D815
TO UX02 TIMER, SELECTOR, COUNTER CIRCUITS.
V-REF
RESET
RESET OUT
W804A ⑤
P804
AC40V
D819, C818
+40V RECT
TP807
+32V
W801 ⑤
P201 ⑤
TO U102, PIF SELECTOR, VIDEO, AUDIO CIRCUITS.
D820
-40V RECT
TP806
-28V
W804A ④
D821, D822, D823
-22V REGULATOR
-22V
W804A ③
TO UX02 TIMER, SELECTOR, COUNTER CIRCUIT.
AC3.1V
AC3.1V
AC3.1V
W804A ②
AC3.1V
W804A ①

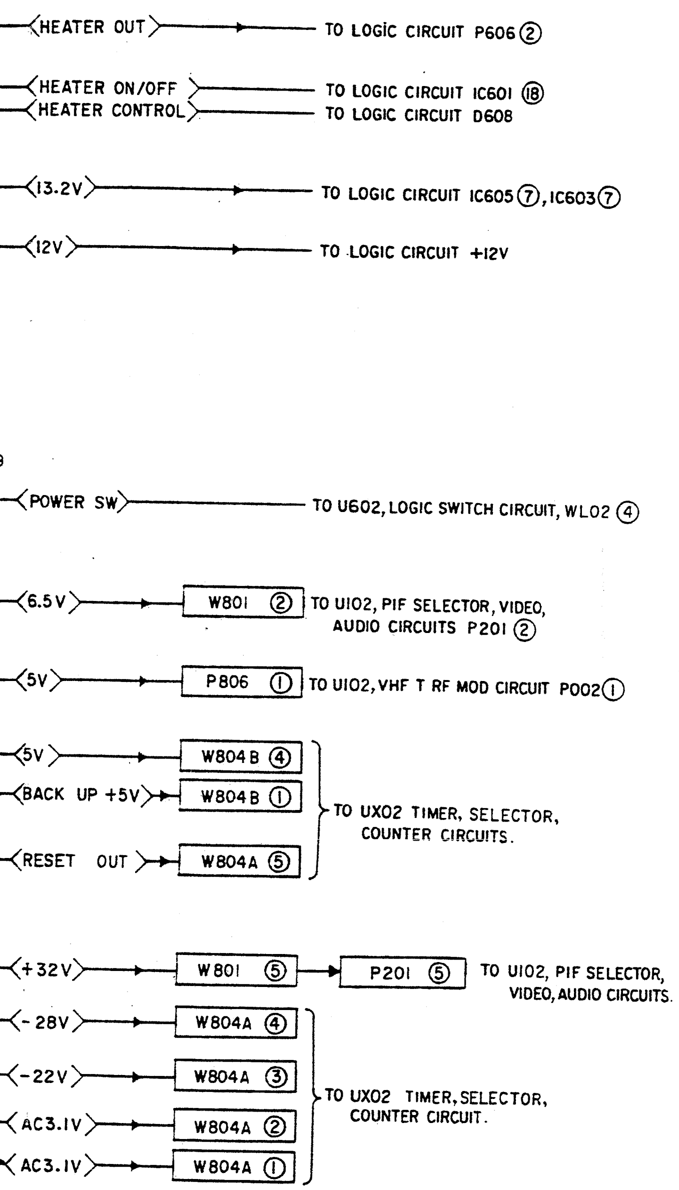
8. Power Supply PC Board



U502 Power supp

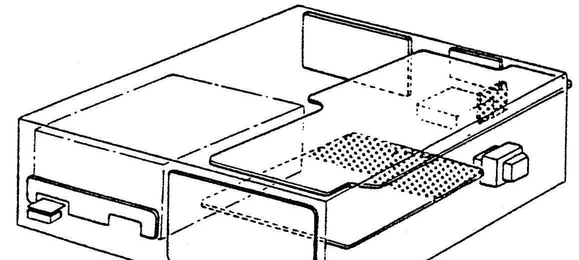


W804B
4 3 2 1
TO UX02 TIMER, LOGIC, SELECTOR
5 4 3 2 1
W804A
W801
5 4 3 2 1
TO U102 PIF. SELECTOR, VIDEO, AUDIO CIRCUIT
TO H002 VHF T RF MOD
4 3 2 1
TO H002 ②
P806
P804
1 2 3 4
TO T802 POWER TRANS
P803
3 2 1
TO T802 POWER TRANS
P805
3 2 1
TO Q801 POWER TRANSISTOR
Q809
Q808
Q810
Q811
Q812
Q806
Q805
Q802
C816
R817
R818
D816
D818
TP-805
T5V
TP803
+6.5V
+13.2V
TP801
TP804
IC5V
GND

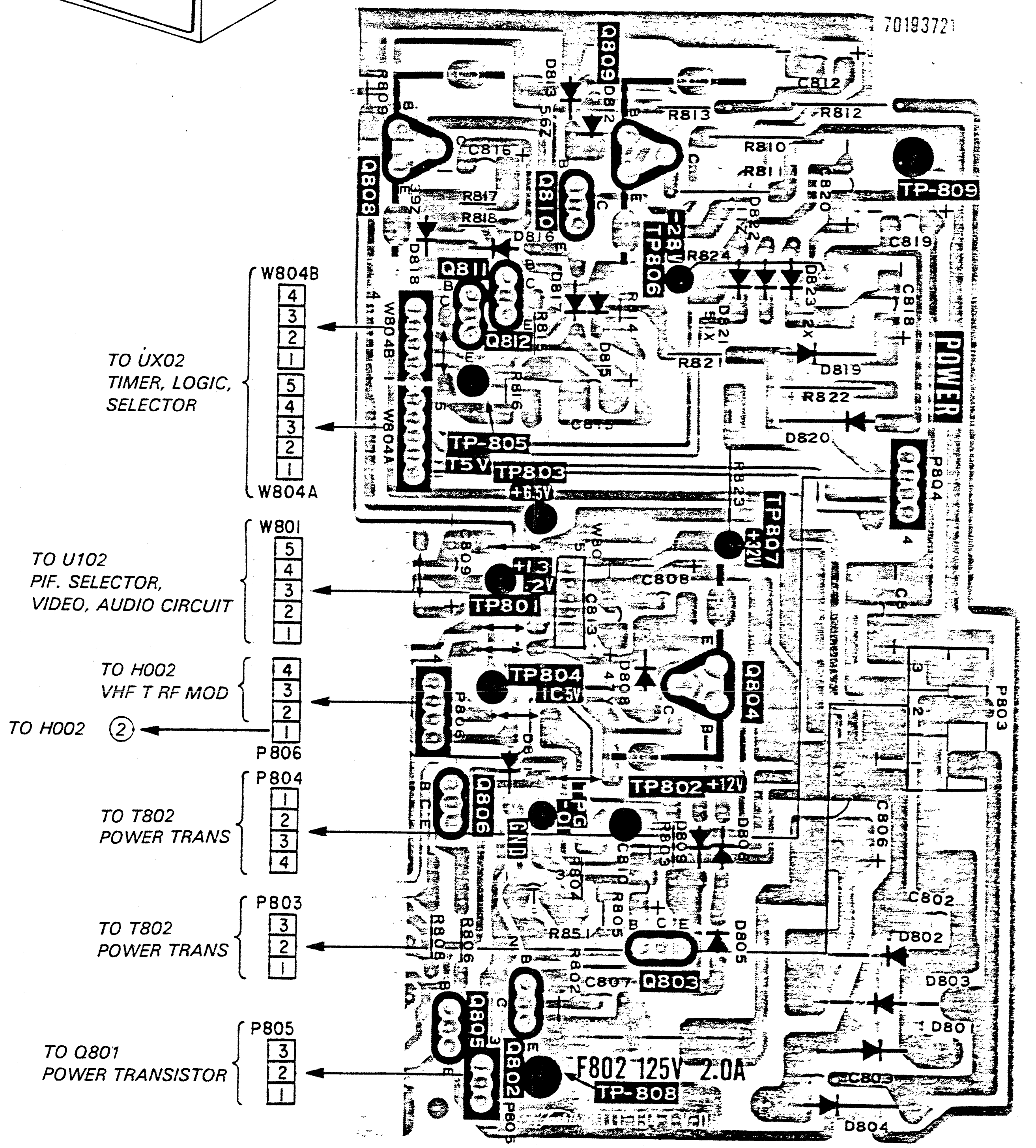


HEATER OUT → TO LOGIC CIRCUIT P606②
HEATER ON/OFF → TO LOGIC CIRCUIT IC601 ⑱
HEATER CONTROL → TO LOGIC CIRCUIT D608
13.2V → TO LOGIC CIRCUIT IC605⑦, IC603⑦
12V → TO LOGIC CIRCUIT +12V
POWER SW → TO U602, LOGIC SWITCH CIRCUIT, WL02 ④
6.5V → W801 ② TO U102, PIF SELECTOR, VIDEO, AUDIO CIRCUITS P201 ②
5V → P806 ① TO U102, VHF T RF MOD CIRCUIT P002①
5V → W804B ④
BACK UP +5V → W804B ①
RESET OUT → W804A ⑤
TO UX02 TIMER, SELECTOR, COUNTER CIRCUITS.
+32V → W801 ⑤ → P201 ⑤ TO U102, PIF SELECTOR, VIDEO, AUDIO CIRCUITS.
-28V → W804A ④
-22V → W804A ③
AC3.1V → W804A ②
AC3.1V → W804A ①
TO UX02 TIMER, SELECTOR, COUNTER CIRCUIT.

8. Power Supply PC Board



U502 Power supply PC board (Bottom View)



1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
70193721
W804B
4
3
2
1
5
4
3
2
1
W804A
TO UX02 TIMER, LOGIC, SELECTOR
W801
5
4
3
2
1
TO U102 PIF. SELECTOR, VIDEO, AUDIO CIRCUIT
TO H002 VHF T RF MOD
4
3
2
1
P806
TO H002 ②
P804
1
2
3
4
TO T802 POWER TRANS
P803
3
2
1
TO T802 POWER TRANS
P805
3
2
1
TO Q801 POWER TRANSISTOR
Q809
Q808
Q810
Q811
Q812
Q804
Q806
Q803
Q805
Q802
TP-809
TP806 -28V
TP-805 T5V
TP803 +6.5V
TP807 +12V
TP801 +13.2V
TP804 IC5V
TP802 +12V
TP-808
F802 125V 2.0A
POWER
GND
C812
R813
R812
R810
R811
C816
R817
R818
D813
D812
D816
D818
D817
D815
R816
C815
R824
D821
D823
D819
R821
R822
D820
C819
C818
P804
R823
C809
C808
C813
D808
D806
P806
R807
C810
R809
D809
C806
C802
D802
D803
D801
C803
D804
R851
R805
R806
R808
R802
C807
D805
P803
P805

Location of Transistors

Symbol No.	Location
Q802	G-4
Q803	G-4
Q804	E-5
Q805	G-4
Q806	F-4
Q808	C-3
Q809	C-4
Q810	C-4
Q811	C-4
Q812	C-4

Voltage (V)

V : Rec/Play mode
▭ : EE mode
(V) : Power off mode

Symbol No.	B	E	C
Q802	21.4 22.1 (25.9)	22.0 22.6 (25.9)	13.9 13.8 (0V)
Q803	7.1 7.1 (4.6)	6.5 6.5 (4.2)	21.4 22.1 (25.9)
Q804	12.6 12.6 (0)	12.0 12.0 (0)	13.2 13.2 (0V)
Q805	21.4 21.9 (25.1)	22.0 22.6 (25.9)	0 22.6 (25.8)
Q806	0.4 0.7 (0.7)	0 0 (0	21.4 0.1 (0.1)
Q808	7.2 7.1 (0)	6.5 6.5 (0	9.6 10.3 (12.8)
Q809	5.8 5.8 (5.8)	5.2 5.2 (5.8	9.6 10.1 (12.8)
Q810	6.4 6.4 (6.4)	5.2 5.2 (5.2	9.6 10.3 (12.8)
Q811	0 0 (0)	0 0 (0	5.2 5.2 (5.2)
Q812	0.7 0.7 (0.7)	0 0 (0	0 0 (0

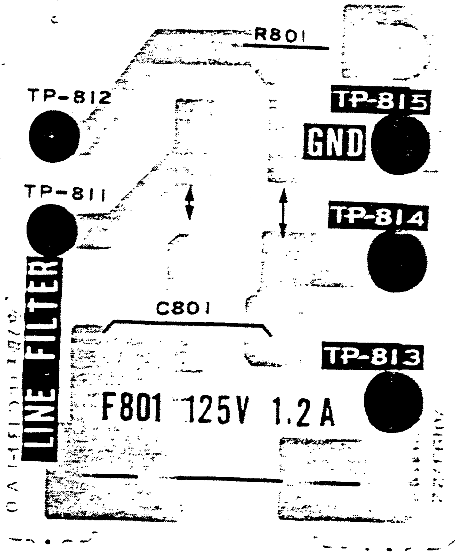
Location of Diodes

Symbol No.	Location
D801	G-6
D802	G-6
D803	G-6
D804	G-5
D805	G-5
D806	F-5
D808	E-5
D809	F-5
D811	F-4
D813	B-4
D815	C-4
D819	D-5
D820	D-5
D821	C-5
D822	C-5
D823	C-5
D812	C-4
D816	C-4
D817	C-4
D818	C-3

Location of Adjusting VR

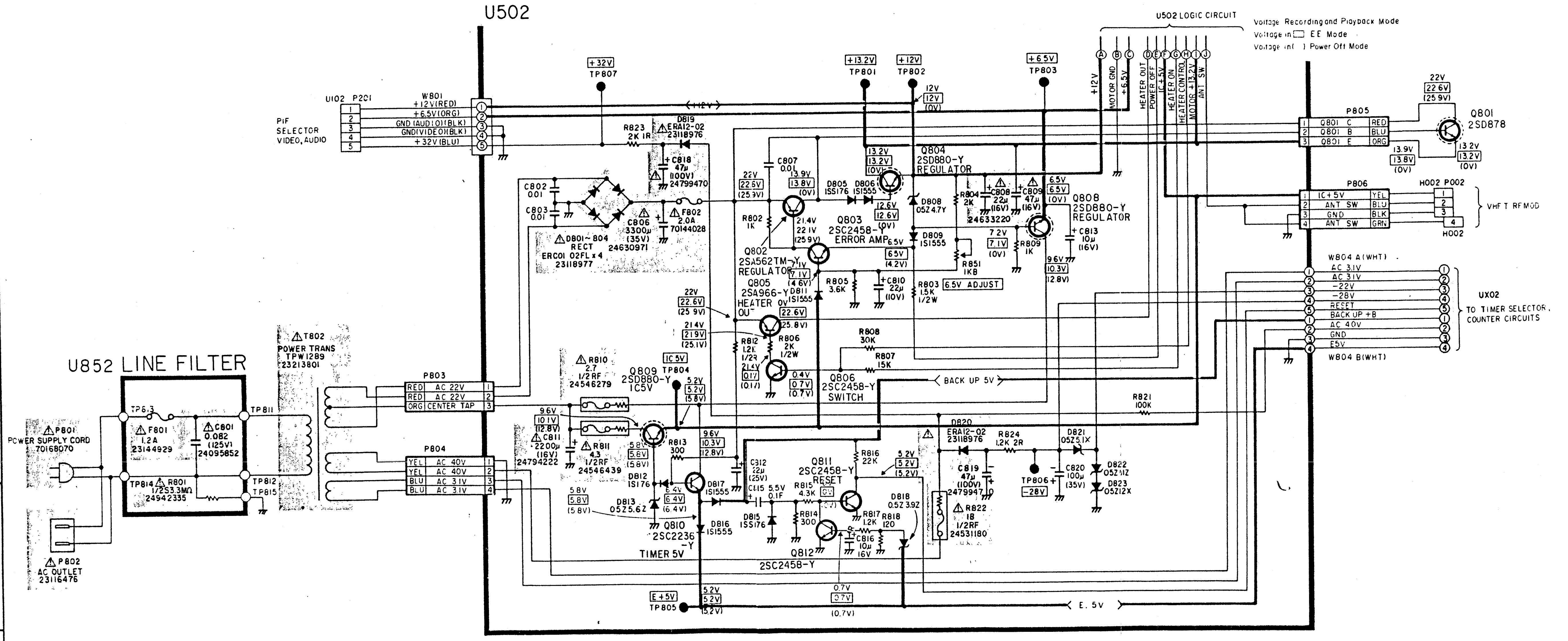
Symbol No.	Location
R851	F-4

U852 Line filter PC board (Bottom View)

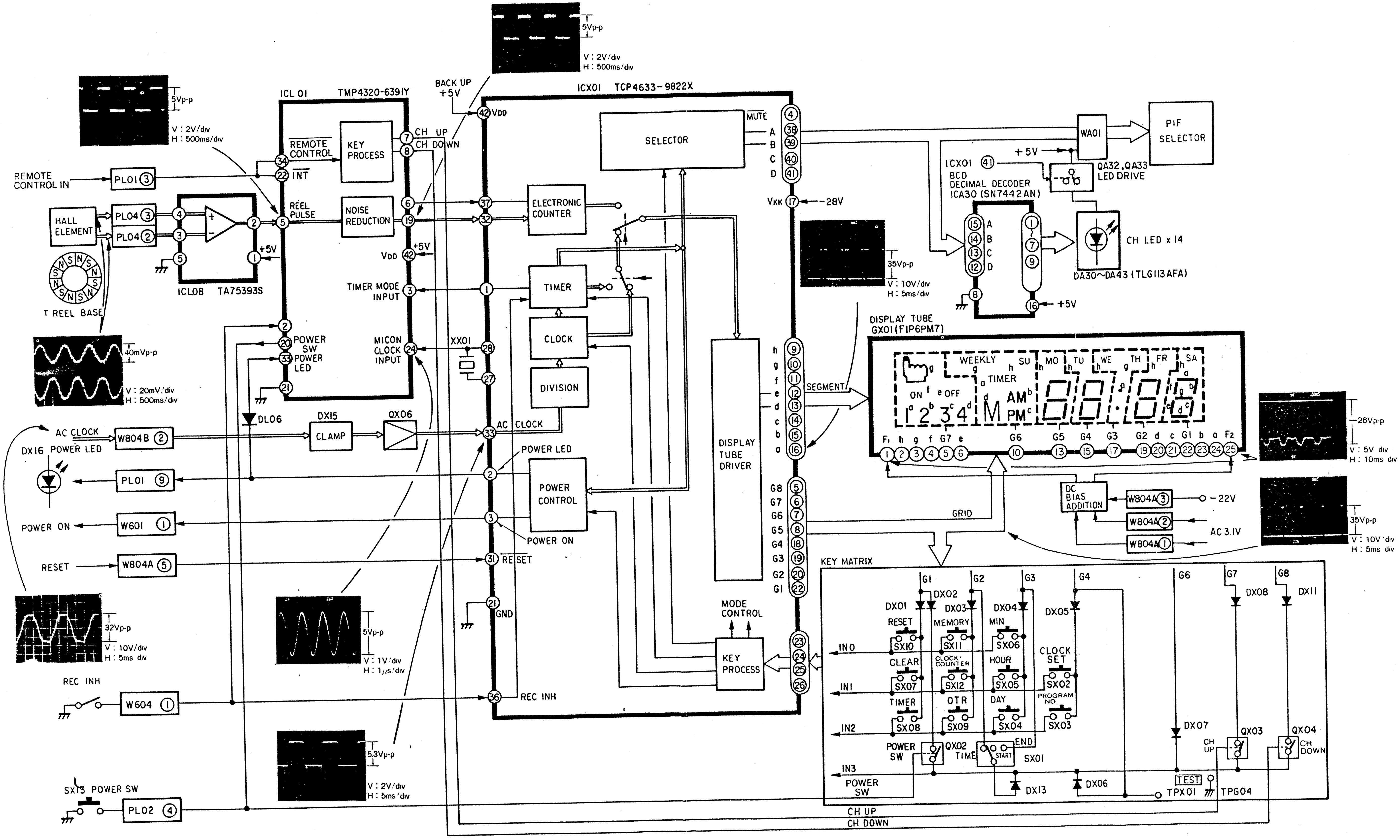


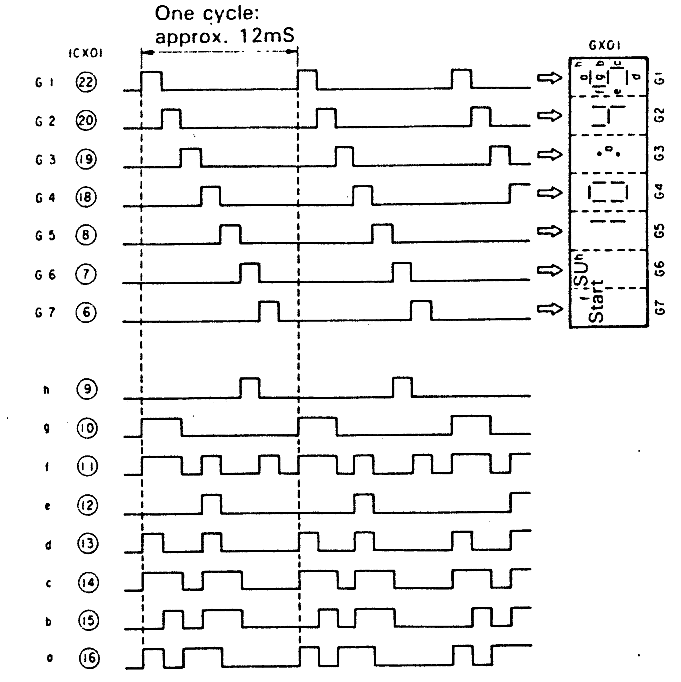
R801
TP-812
TP-815
GND
TP-811
TP-814
C801
TP-813
LINE FILTER
F801 125V 1.2A

9. Power Supply Circuit


U502
U852 LINE FILTER
P801 POWER SUPPLY CORD 70168070
P802 AC OUTLET 23116476
F801 1.2A 23144929
C801 0.082 (125V) 24095852
R801 1/2S3.3MΩ 24942335
TP811
TP812
TP814
TP815
T802 POWER TRANS TPW1289 23213801
P803
RED AC 22V
RED AC 22V
ORG CENTER TAP
P804
YEL AC 40V
YEL AC 40V
BLU AC 3.1V
BLU AC 3.1V
U102 P201
PIF SELECTOR VIDEO, AUDIO
W801
+12V(RED)
+6.5V(ORG)
GND(AUDIO)(BLK)
GND(VIDEO)(BLK)
+32V(BLU)
+32V TP807
R823 2K 1R
D819 ERA12-02 23118976
C818 47μ (100V) 24799470
C802 0.01
C803 0.01
D801~804 RECT ERC01 02FL×4 23118977
C806 3300μ (35V) 24630971
F802 2.0A 70144028
C807 0.01
R802 1K
Q802 2SA562TM-Y REGULATOR
Q805 2SA966-Y HEATER OUT
D805 1SS176
D806 1S1555
Q803 2SC2458-Y ERROR AMP
R805 3.6K
C810 22μ (10V)
D811 1S1555
R806 2K 1/2W
R812 1.2K 1/2W
+13.2V TP801
+12V TP802
Q804 2SD880-Y REGULATOR
D808 05Z4.7Y
D809 1S1555
R804 2K
C808 22μ (16V)
R851 1K8
R803 1.5K 1/2W
6.5V ADJUST
+6.5V TP803
C809 47μ (16V) 24633220
R809 1K
Q808 2SD880-Y REGULATOR
C813 10μ (16V)
R808 30K
R807 15K
Q806 2SC2458-Y SWITCH
BACK UP 5V
R810 2.7 1/2RF 24546279
Q809 2SD880-Y IC5V
IC5V TP804
C811 2200μ (16V) 24794222
R811 4.3 1/2RF 24546439
R813 300
D812 1S176
D813 05Z5.6Z
Q810 2SC2236-Y TIMER 5V
D817 1S1555
D816 1S1555
C312 22μ (25V)
C815 0.1F
R815 4.3K
D815 1SS176
R814 300
Q811 2SC2458-Y RESET
R816 22K
Q812 2SC2458-Y
R817 1.2K
R818 120
C816 10μ 16V
D818 05Z3.9Z
D820 ERA12-02 23118976
R824 1.2K 2R
C819 47μ (100V) 2479947
R822 18 1/2RF 24531180
TP806 -28V
C820 100μ (35V)
D821 05Z5.1X
D822 05Z12Z
D823 05Z12X
R821 100K
E+5V TP805
E. 5V
U502 LOGIC CIRCUIT
+12V
MOTOR GND
+6.5V
HEATER OUT
POWER OFF
IC+5V
HEATER ON
HEATER CONTROL
MOTOR +13.2V
ANT SW
Voltage Recording and Playback Mode
Voltage in ☐ EE Mode
Voltage in ( ) Power Off Mode
P805
Q801 C RED
Q801 B BLU
Q801 E ORG
Q801 2SD878
P806
IC+5V YEL
ANT SW BLU
GND BLK
ANT SW GRN
H002 P002
H002
VHF T RF MOD
W804 A(WHT)
AC 3.1V
AC 3.1V
-22V
-28V
RESET
BACK UP +B
AC 40V
GND
E5V
W804 B(WHT)
UX02
TO TIMER SELECTOR, COUNTER CIRCUITS

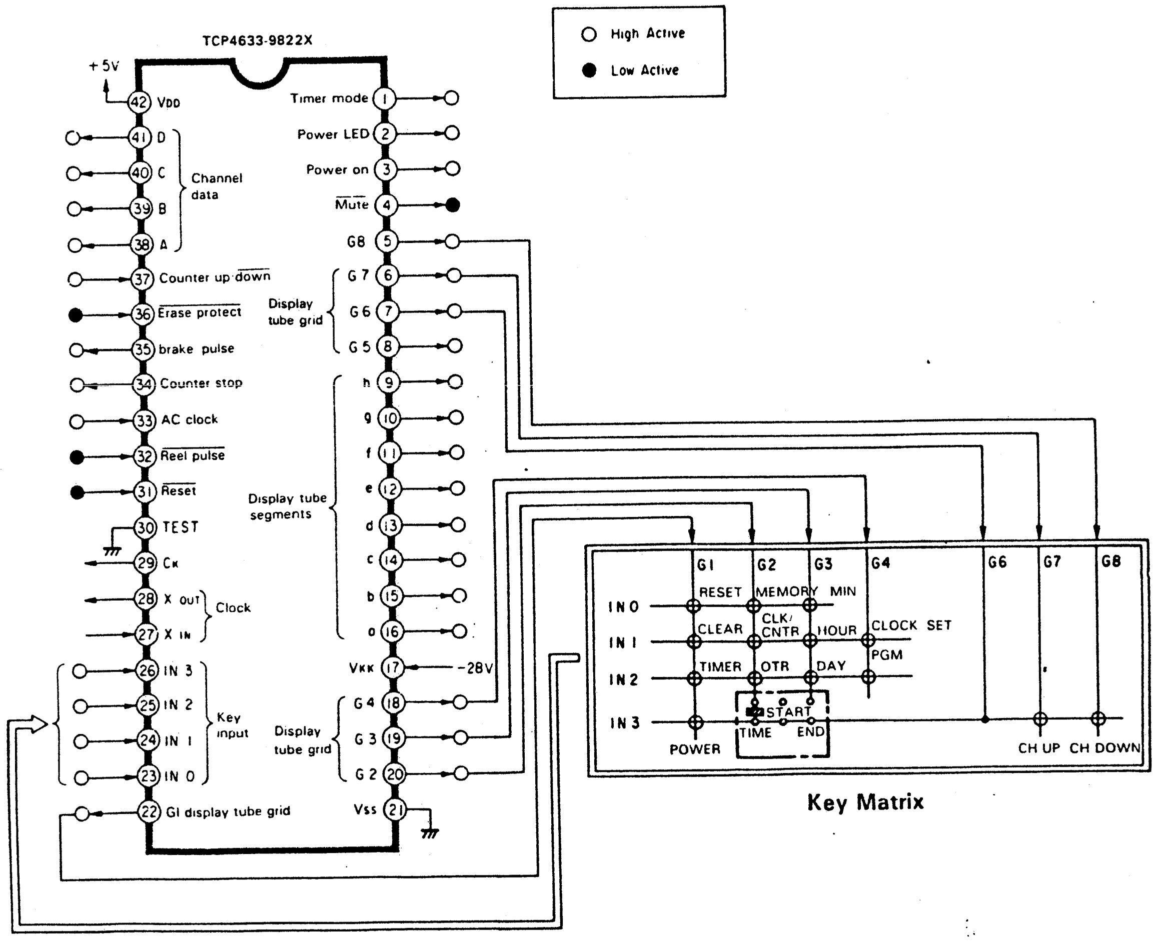
10. Timer, Channel Selector and Electronic Counter Block Diagrams


5Vp-p
V : 2V/div
H : 500ms/div
ICL 01 TMP4320-6391Y
BACK UP +5V
ICX01 TCP4633-9822X
REMOTE CONTROL IN
PL01 ③
HALL ELEMENT
PL04 ③
PL04 ②
T REEL BASE
ICL08 TA75393S
+5V
REMOTE CONTROL
KEY PROCESS
INT
REEL PULSE
NOISE REDUCTION
CH UP
CH DOWN
VDD
TIMER MODE INPUT
MICON CLOCK INPUT
POWER SW
POWER LED
XX01
40mVp-p
V : 20mV/div
H : 500ms/div
SELECTOR
MUTE
A
B
C
D
VKK
-28V
ELECTRONIC COUNTER
TIMER
CLOCK
DIVISION
AC CLOCK
POWER LED
POWER CONTROL
POWER ON
RESET
GND
REC INH
DISPLAY TUBE DRIVER
MODE CONTROL
KEY PROCESS
SEGMENT
GRID
35Vp-p
V : 10V/div
H : 5ms/div
WA01
PIF SELECTOR
+5V
ICX01 ㊶
BCD DECIMAL DECODER
ICA30 (SN7442AN)
QA32, QA33 LED DRIVE
CH LED x 14
DA30~DA43 (TLG113AFA)
DISPLAY TUBE GX01 (FIP6PM7)
WEEKLY
SU
MO
TU
WE
TH
FR
SA
TIMER
ON
OFF
AM
PM
F1 h g f G7 e G6 G5 G4 G3 G2 d c G1 b a F2
-26Vp-p
V : 5V div
H : 10ms div
DC BIAS ADDITION
W804A ③
-22V
W804A ②
W804A ①
AC 3.1V
35Vp-p
V : 10V div
H : 5ms div
KEY MATRIX
G1
G2
G3
G4
G6
G7
G8
DX01
DX02
DX03
DX04
DX05
DX08
DX11
RESET
SX10
MEMORY
SX11
MIN
SX06
CLOCK SET
SX02
CLEAR
SX07
CLOCK/COUNTER
SX12
HOUR
SX05
PROGRAM NO
SX03
TIMER
SX08
OTR
SX09
DAY
SX04
IN0
IN1
IN2
IN3
POWER SW
QX02 TIME
END
START
SX01
DX07
DX13
DX06
QX03
CH UP
QX04
CH DOWN
TEST
TPX01
TPG04
POWER SW
AC CLOCK
DX16 POWER LED
W804B ②
DX15 CLAMP
QX06
DL06
PL01 ⑨
POWER ON
W601 ①
RESET
W804A ⑤
32Vp-p
V : 10V/div
H : 5ms div
5Vp-p
V : 1V/div
H : 1μs/div
REC INH
W604 ①
5.3Vp-p
V : 2V/div
H : 5ms/div
SX13 POWER SW
PL02 ④
CH UP
CH DOWN



Timing Chart Example of Fluorescent Display

(10:45)

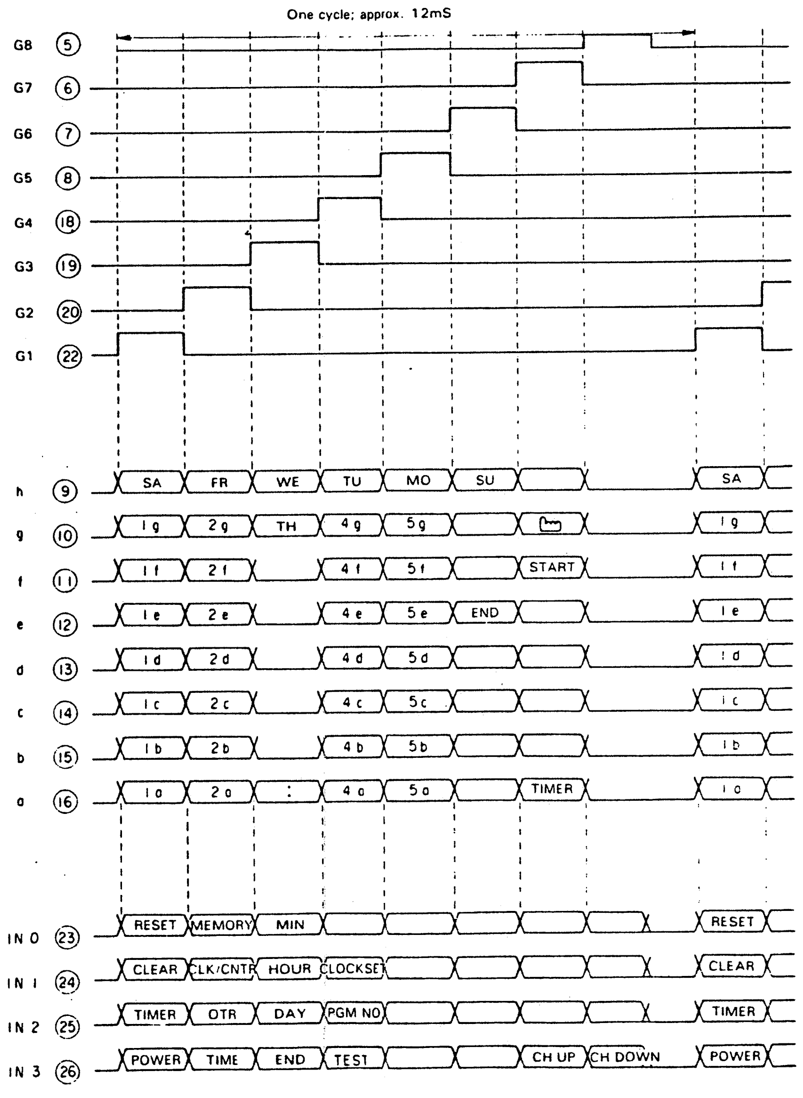

TCP4633-9822X
+5V
○ High Active
● Low Active
㊷ VDD
㊶ D
㊵ C
㊴ B
㊳ A
Channel data
㊲ Counter up down
㊱ Erase protect
㉟ brake pulse
㉞ Counter stop
㉝ AC clock
㉜ Reel pulse
㉛ Reset
㉚ TEST
㉙ CK
㉘ X out
㉗ X in
Clock
㉖ IN 3
㉕ IN 2
㉔ IN 1
㉓ IN 0
Key input
㉒ G1 display tube grid
Timer mode ①
Power LED ②
Power on ③
Mute ④
G8 ⑤
G7 ⑥
G6 ⑦
G5 ⑧
Display tube grid
h ⑨
g ⑩
f ⑪
e ⑫
d ⑬
c ⑭
b ⑮
a ⑯
Display tube segments
VKK ⑰ -28V
G4 ⑱
G3 ⑲
G2 ⑳
Display tube grid
VSS ㉑
G1
G2
G3
G4
G6
G7
G8
IN 0
IN 1
IN 2
IN 3
RESET
MEMORY
MIN
CLEAR
CLK/CNTR
HOUR
CLOCK SET
PGM
TIMER
OTR
DAY
START
TIME
END
POWER
CH UP
CH DOWN

Key Matrix

ICX01 Timer/Counter

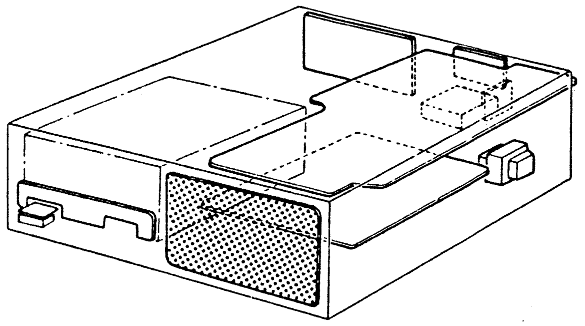
	G 8	G 7	G 6	G 5	G 4	G 3	G 2	G 1
h			SU	MO	TU	WE	FR	SA
g		☞	WEEKLY	Seg・g	Seg・g	TH	Seg・g	Seg・g
f		START		Seg・f	Seg・f		Seg・f	Seg・f
e		END		Seg・e	Seg・e		Seg・e	Seg・e
d		4	M	Seg・d	Seg・d		Seg・d	Seg・d
c		3	PM	Seg・c	Seg・c		Seg・c	Seg・c
b		2	AM	Seg・b	Seg・b		Seg・b	Seg・b
a		1	TIMER	Seg・a	Seg・a	COLON	Seg・a	Seg・a

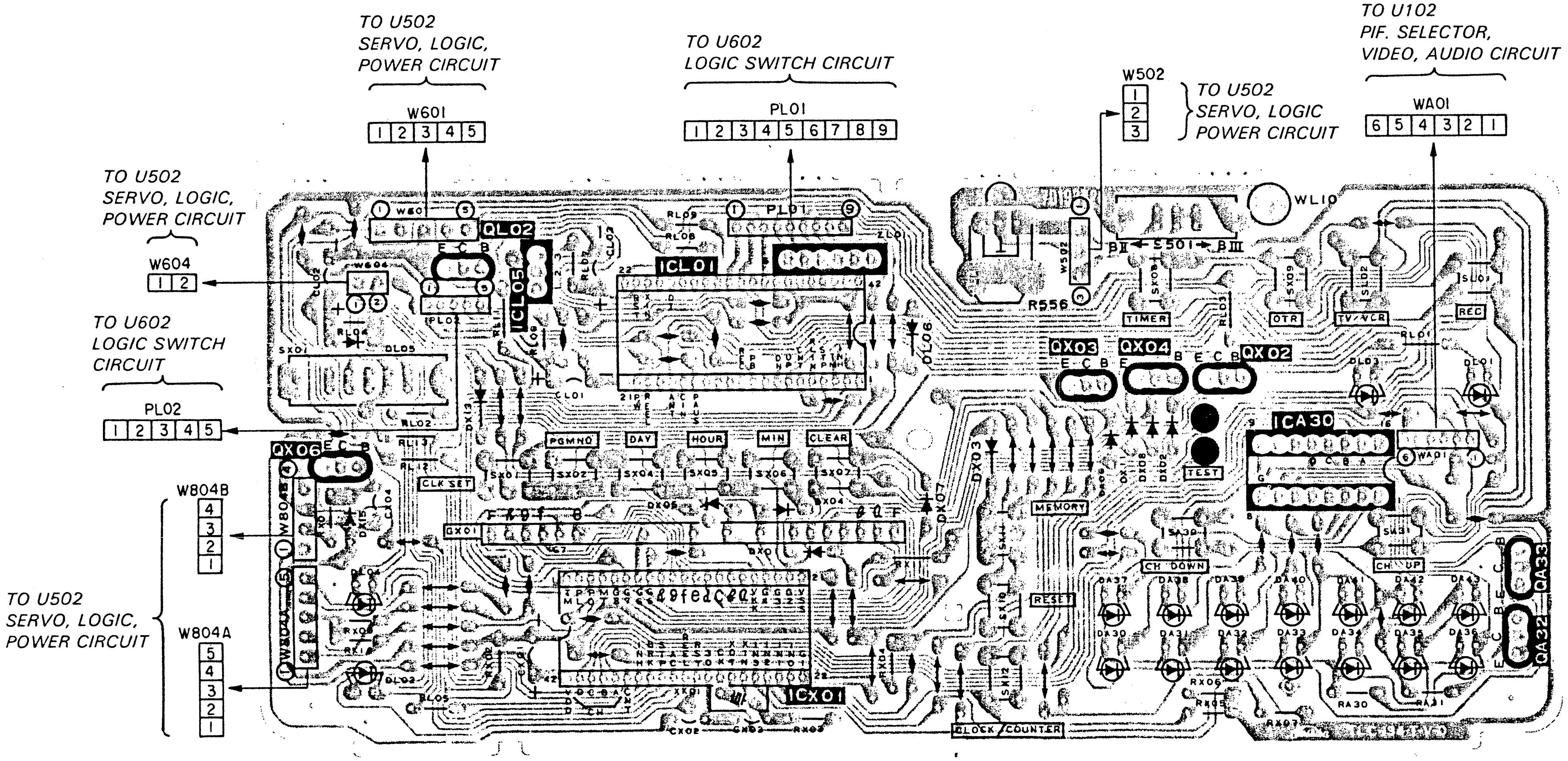
Display digits and segments



Key Matrix

11. Timer, Channel Selector and Electronic Counter PC Board




TO U502
SERVO, LOGIC,
POWER CIRCUIT
W601
1 2 3 4 5
TO U602
LOGIC SWITCH CIRCUIT
PL01
1 2 3 4 5 6 7 8 9
W502
1 2 3
TO U502
SERVO, LOGIC
POWER CIRCUIT
TO U102
PIF. SELECTOR,
VIDEO, AUDIO CIRCUIT
WA01
6 5 4 3 2 1
TO U502
SERVO, LOGIC,
POWER CIRCUIT
W604
1 2
TO U602
LOGIC SWITCH
CIRCUIT
PL02
1 2 3 4 5
W804B
4 3 2 1
TO U502
SERVO, LOGIC,
POWER CIRCUIT
W804A
5 4 3 2 1
QL02
ICL05
ICL01
QX03
QX04
QX02
ICA30
QX06
ICX01
QA33
QA32
R556
S501
WL10
TIMER
OTR
TV/VCR
REC
PGMNO
DAY
HOUR
MIN
CLEAR
CLK SET
MEMORY
TEST
CH DOWN
CH UP
RESET
CLOCK/COUNTER

Location of Transistor

Symbol No.	Mute ON			Mute OFF			Location
	B	C	E	B	C	E	
QX02	0.0	4.3P	4.3P	4.9	4.3P	4.3P	E-7
QX03	0.0	4.3P	4.3P	4.9	4.3P	4.3P	E-6
QX04	0.0	4.3P	4.3P	4.9	4.3P	4.3P	E-6
QX06	5.7	5.1	5.0	−0.7	5.1	0.0	E-2

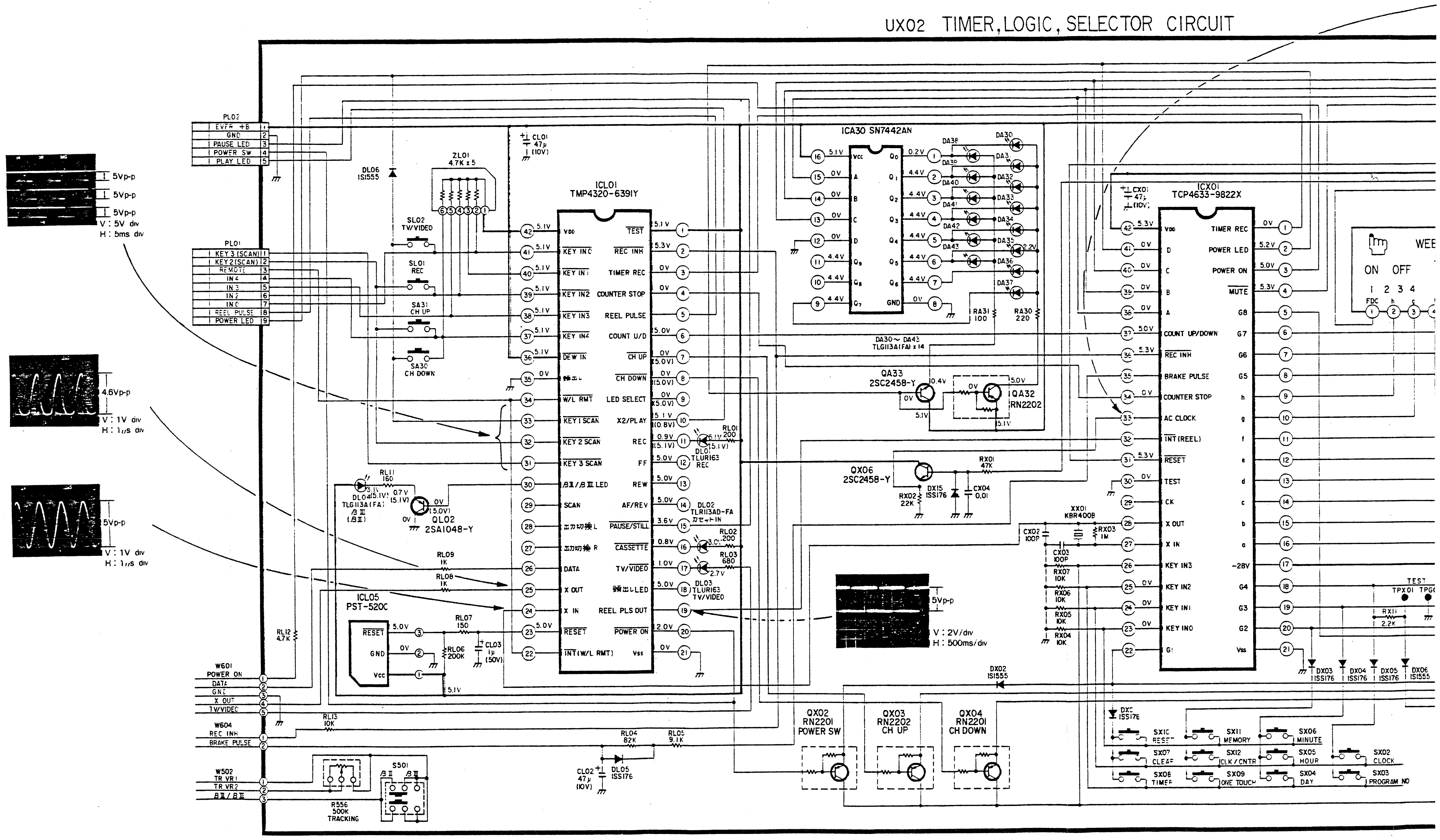
VR

Symbol No.	Description	Name	Location
R556	500K	Tracking VR	D-6

Location of Diodes

Symbol No.	Location	Symbol No.	Location
DA30	F-6	DL03	E-7
DA31	F-6	DL04	F-2
DA32	F-7	DL05	D-2
DA33	F-7	DL06	D-5
DA34	F-7	DX01	E-5
DA35	F-8	DX02	E-6
DA36	F-8	DX03	E-5
DA37	F-6	DX04	E-4
DA38	F-6	DX05	E-4
DA39	F-7	DX06	E-6
DA40	F-7	DX07	E-5
DA41	F-7	DX08	E-6
DA42	F-8	DX11	E-6
DA43	F-8	DX13	E-3
DL01	E-8	DX15	E-2
DL02	F-2		

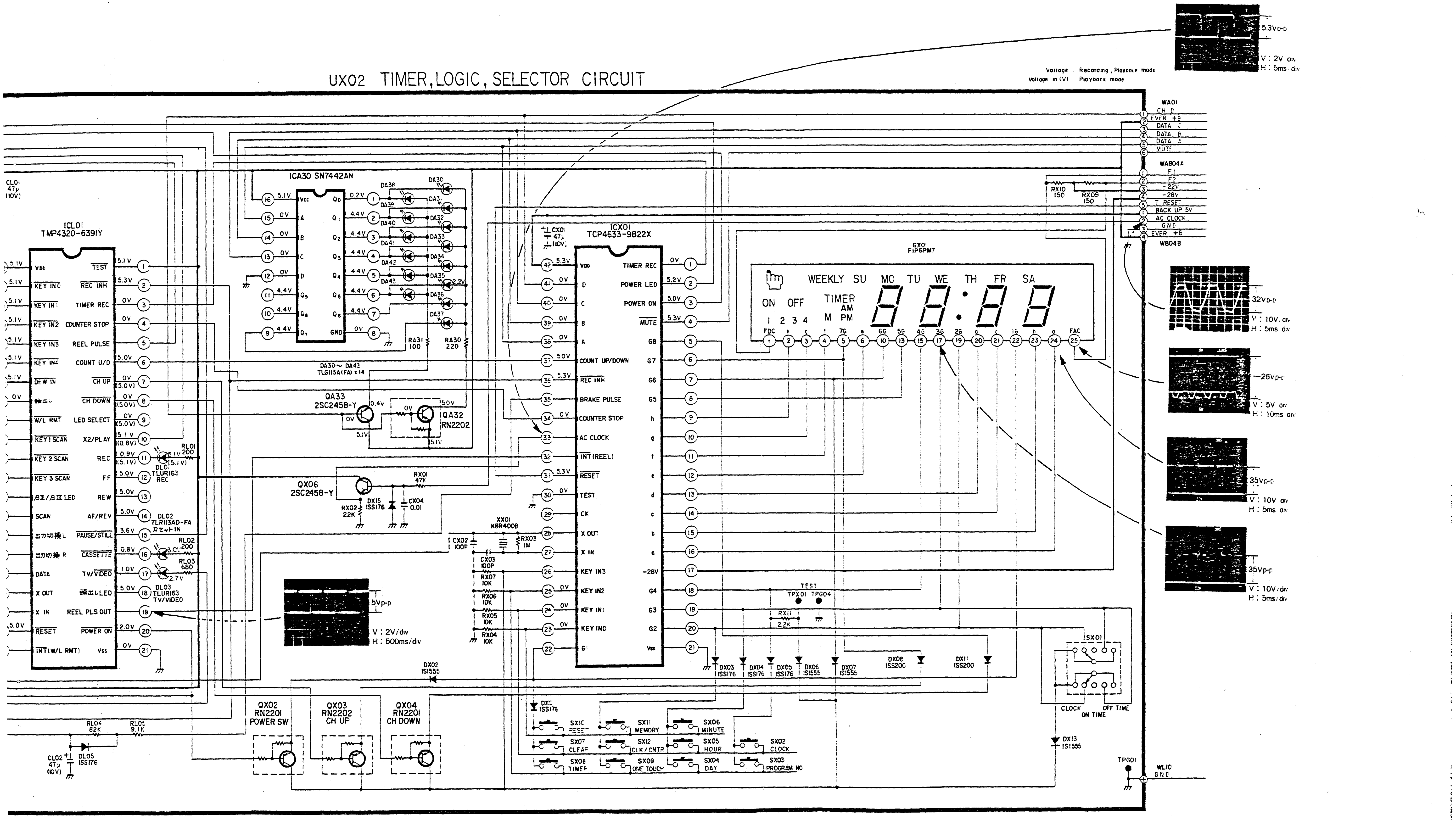
12. Timer, Channel Selector and Electronic Counter Circuits


UX02 TIMER, LOGIC, SELECTOR CIRCUIT
5Vp-p
5Vp-p
5Vp-p
V : 5V div
H : 5ms div
4.6Vp-p
V : 1V div
H : 1μs div
5Vp-p
V : 1V div
H : 1μs div
5Vp-p
V : 2V/div
H : 500ms/div
PL02
EVER +B
GND
PAUSE LED
POWER SW
PLAY LED
PL01
KEY 3 (SCAN)
KEY 2 (SCAN)
REMOTE
IN 4
IN 3
IN 2
IN 0
REEL PULSE
POWER LED
DL06 1S1555
ZL01 4.7K x 5
SL02 TV/VIDEO
SL01 REC
SA31 CH UP
SA30 CH DOWN
CL01 47μ (10V)
ICL01 TMP4320-6391Y
VDD
KEY IN0
KEY IN1
KEY IN2
KEY IN3
KEY IN4
DEW IN
W/L RMT
KEY 1 SCAN
KEY 2 SCAN
KEY 3 SCAN
βII/βIII LED
SCAN
DATA
X OUT
X IN
RESET
INT (W/L RMT)
TEST
REC INH
TIMER REC
COUNTER STOP
REEL PULSE
COUNT U/D
CH UP
CH DOWN
LED SELECT
X2/PLAY
REC
FF
REW
AF/REV
PAUSE/STILL
CASSETTE
TV/VIDEO
REEL PLS OUT
POWER ON
VSS
RL01 200
DL01 TLUR163 REC
DL02 TLRI13AD-FA
RL02 200
RL03 680
DL03 TLUR163 TV/VIDEO
RL11 160
DL04 TLG113A (FA) βII (βIII)
QL02 2SA1048-Y
RL09 1K
RL08 1K
ICL05 PST-520C
RESET
GND
Vcc
RL07 150
RL06 200K
CL03 1μ (50V)
RL12 4.7K
W601
POWER ON
DATA
GND
X OUT
TV/VIDEO
W604
REC INH
BRAKE PULSE
RL13 10K
W502
TR VR1
TR VR2
βII/βIII
R556 500K TRACKING
S501
RL04 82K
RL05 9.1K
CL02 47μ (10V)
DL05 1SS176
ICA30 SN7442AN
DA30 ~ DA43 TLG113A (FA) x 14
RA31 100
RA30 220
QA33 2SC2458-Y
QA32 RN2202
QX06 2SC2458-Y
RX01 47K
RX02 22K
DX15 1SS176
CX04 0.01
QX02 RN2201 POWER SW
QX03 RN2202 CH UP
QX04 RN2201 CH DOWN
DX02 1S1555
XX01 KBR400B
CX02 100P
CX03 100P
RX03 1M
RX07 10K
RX06 10K
RX05 10K
RX04 10K
CX01 47μ (10V)
ICX01 TCP4633-9822X
VDD
D
C
B
A
COUNT UP/DOWN
REC INH
BRAKE PULSE
COUNTER STOP
AC CLOCK
INT (REEL)
RESET
TEST
CK
X OUT
X IN
KEY IN3
KEY IN2
KEY IN1
KEY IN0
TIMER REC
POWER LED
POWER ON
MUTE
G8
G7
G6
G5
-28V
G4
G3
G2
Vss
DX03 1SS176
DX04 1SS176
DX05 1SS176
DX06 1S1555
DX 1SS176
SX10 RESET
SX07 CLEAR
SX08 TIMER
SX11 MEMORY
SX12 CLK/CNTR
SX09 ONE TOUCH
SX06 MINUTE
SX05 HOUR
SX04 DAY
SX02 CLOCK
SX03 PROGRAM NO
TEST TPX01
RX11 2.2K
WEE
ON OFF
FDC

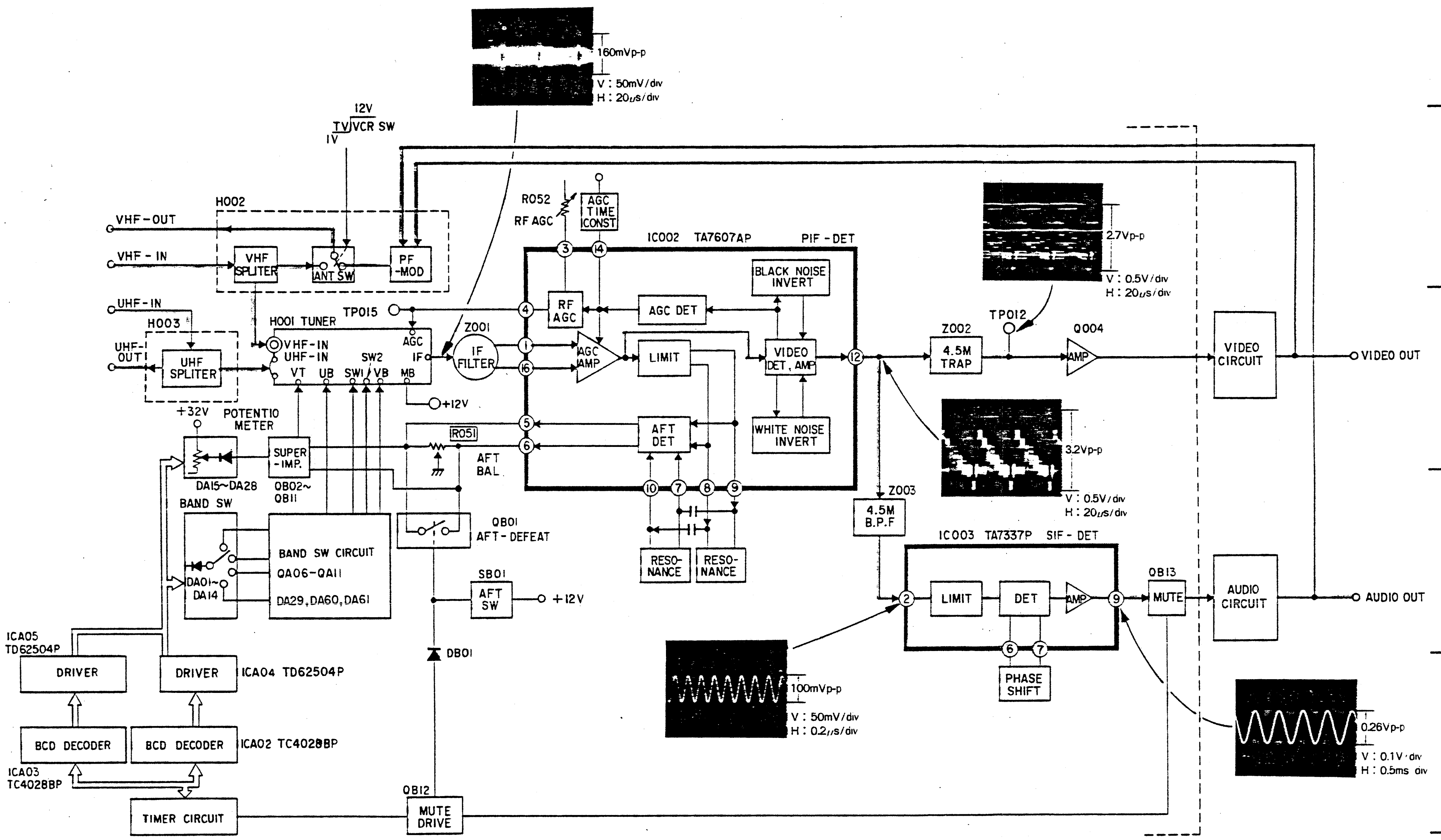
S

UX02 TIMER, LOGIC, SELECTOR CIRCUIT

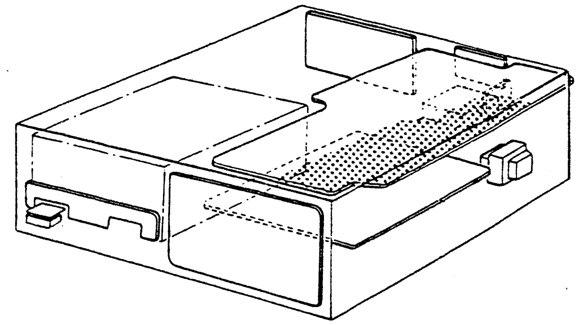
Voltage : Recording, Playback mode
Voltage in (V) Playback mode


ICL01
TMP4320-6391Y
VDD
TEST
KEY INC
REC INH
KEY IN1
TIMER REC
KEY IN2
COUNTER STOP
KEY IN3
REEL PULSE
KEY IN4
COUNT U/D
DEW IN
CH UP
CH DOWN
W/L RMT
LED SELECT
KEY1 SCAN
X2/PLAY
KEY 2 SCAN
REC
KEY 3 SCAN
FF
βII/βIII LED
REW
SCAN
AF/REV
出力切換 L
PAUSE/STILL
出力切換 R
CASSETTE
DATA
TV/VIDEO
X OUT
録画LED
X IN
REEL PLS OUT
RESET
POWER ON
INT(W/L RMT)
Vss
CL01 47μ (10V)
CL02 47μ (10V)
DL05 1SS176
RL04 82K
RL05 9.1K
RL01 200
DL01 TLUR163 REC
DL02 TLR113AD-FA カセットIN
RL02 200
RL03 680
DL03 TLUR163 TV/VIDEO
ICA30 SN7442AN
Vcc
GND
DA30～DA43 TLG113A(FA) x 14
RA31 100
RA30 220
QA33 2SC2458-Y
QA32 RN2202
QX06 2SC2458-Y
RX01 47K
RX02 22K
DX15 1SS176
CX04 0.01
XX01 KBR400B
CX02 100P
CX03 100P
RX03 1M
RX07 10K
RX06 10K
RX05 10K
RX04 10K
ICX01
TCP4633-9822X
CX01 47μ (10V)
TIMER REC
POWER LED
POWER ON
MUTE
COUNT UP/DOWN
REC INH
BRAKE PULSE
COUNTER STOP
AC CLOCK
INT(REEL)
RESET
TEST
CK
X OUT
X IN
KEY IN3
KEY IN2
KEY IN1
KEY IN0
-28V
DX02 1S1555
QX02 RN2201 POWER SW
QX03 RN2202 CH UP
QX04 RN2201 CH DOWN
DX01 1SS176
SX10 RESET
SX11 MEMORY
SX06 MINUTE
SX07 CLEAR
SX12 CLK/CNTR
SX05 HOUR
SX02 CLOCK
SX08 TIMER
SX09 ONE TOUCH
SX04 DAY
SX03 PROGRAM NO
GX01 FIP6PM7
WEEKLY SU MO TU WE TH FR SA
ON OFF
TIMER
AM PM
1 2 3 4 M
FDC h c f 7G e 6G 5G 4G 3G 2G d c 1G b a FAC
TEST
TPX01 TPG04
RX11 2.2K
DX03 1SS176
DX04 1SS176
DX05 1SS176
DX06 1S1555
DX07 1S1555
DX08 1SS200
DX11 1SS200
SX01
CLOCK
ON TIME
OFF TIME
DX13 1S1555
TPG01
WL10 GND
RX10 150
RX09 150
WA01
CH D
EVER +B
DATA C
DATA B
DATA A
MUTE
WA804A
F1
F2
-22V
-28V
T RESET
BACK UP 5V
AC CLOCK
GND
EVER +B
W804B
5.3Vp-p
V : 2V div
H : 5ms div
32Vp-p
V : 10V div
H : 5ms div
26Vp-p
V : 5V div
H : 10ms div
35Vp-p
V : 10V div
H : 5ms div
35Vp-p
V : 10V/div
H : 5ms/div
5Vp-p
V : 2V/div
H : 500ms/div

13. PIF and Channel Selector Block Diagrams


160mVp-p
V : 50mV/div
H : 20μs/div
12V
TV VCR SW
IV
H002
VHF-OUT
VHF - IN
VHF SPLITER
ANT SW
PF -MOD
UHF-IN
H003
UHF-OUT
UHF SPLITER
H001 TUNER
VHF-IN
UHF-IN
VT UB SW1 VB MB
SW2
AGC
IF
TP015
+12V
+32V
POTENTIO METER
SUPER -IMP.
DA15~DA28
QB02~QB11
BAND SW
DA01~DA14
BAND SW CIRCUIT
QA06-QA11
DA29, DA60, DA61
ICA05
TD62504P
DRIVER
DRIVER
ICA04 TD62504P
BCD DECODER
BCD DECODER
ICA02 TC4028BP
ICA03
TC4028BP
TIMER CIRCUIT
R052
RF AGC
AGC TIME CONST
Z001
IF FILTER
IC002 TA7607AP
PIF - DET
RF AGC
AGC DET
AGC AMP
LIMIT
BLACK NOISE INVERT
VIDEO DET, AMP
WHITE NOISE INVERT
AFT DET
R051
AFT BAL
RESO-NANCE
RESO-NANCE
QB01
AFT - DEFEAT
SB01
AFT SW
+12V
DB01
QB12
MUTE DRIVE
2.7Vp-p
V : 0.5V/div
H : 20μs/div
TP012
Z002
4.5M TRAP
Q004
AMP
3.2Vp-p
V : 0.5V/div
H : 20μs/div
Z003
4.5M B.P.F
IC003 TA7337P SIF - DET
LIMIT
DET
AMP
PHASE SHIFT
QB13
MUTE
100mVp-p
V : 50mV/div
H : 0.2μs/div
0.26Vp-p
V : 0.1V/div
H : 0.5ms/div
VIDEO CIRCUIT
AUDIO CIRCUIT
VIDEO OUT
AUDIO OUT

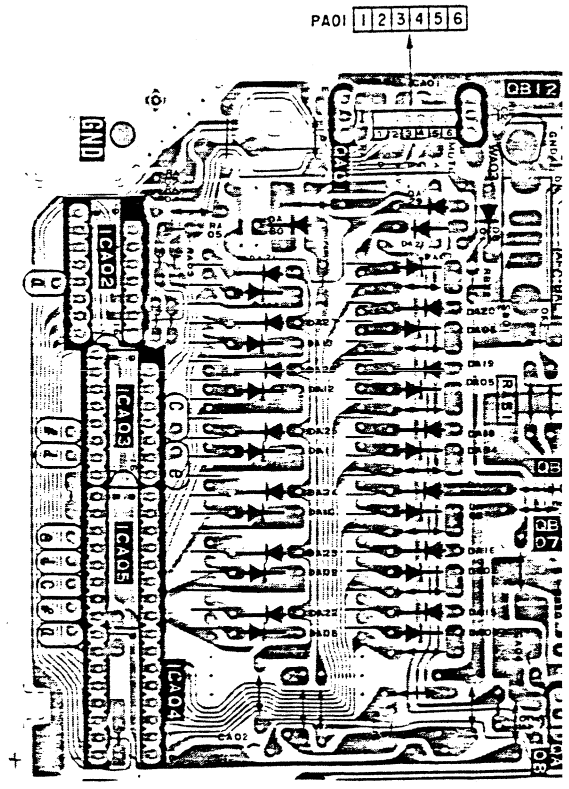
14. PIF and Channel Selector PC Board

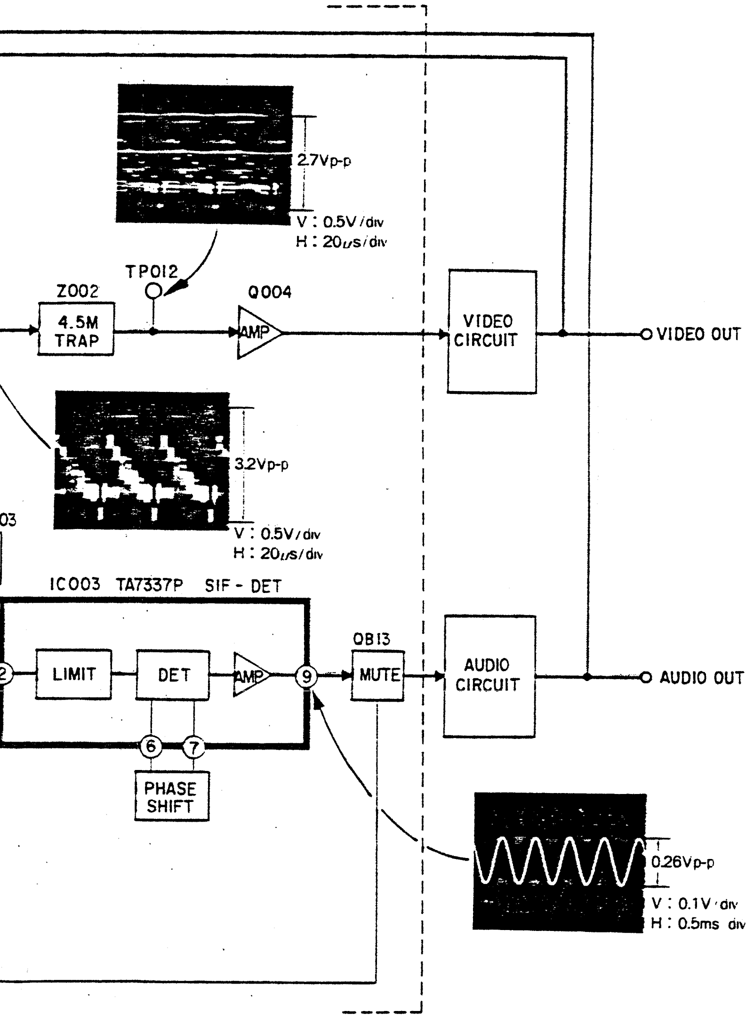


Location of Tra

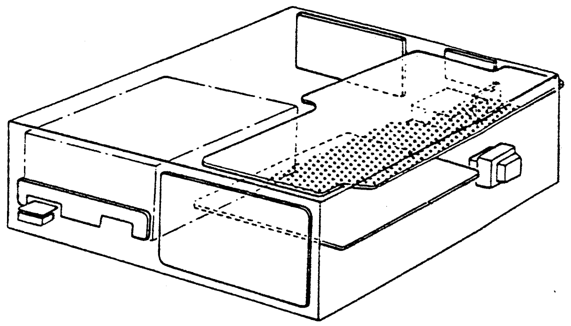
Symbol No.	
Q001	1
Q004	1
QA01	
QA06	11
QA07	
QA08	11
QA09	
QA10	11
QA11	11
QB03	
QB04	23
QB05	
QB06	13
QB07	
QB08	
QB09	
QB10	
QB11	
QB12	
QB13	

TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT


PA01 1 2 3 4 5 6
GND
QB12
ICA02
ICA03
ICA05
ICA04
QB07
+


2.7Vp-p
V : 0.5V/div
H : 20μs/div
TP012
Z002
4.5M TRAP
Q004
AMP
VIDEO CIRCUIT
VIDEO OUT
3.2Vp-p
V : 0.5V/div
H : 20μs/div
03
IC003 TA7337P SIF - DET
2
LIMIT
DET
AMP
9
6
7
PHASE SHIFT
QB13
MUTE
AUDIO CIRCUIT
AUDIO OUT
0.26Vp-p
V : 0.1V/div
H : 0.5ms div

14. PIF and Channel Selector PC Board



Location of Transistors

Symbol No.	B	C	E	Location
Q001	1.2	7.2	0.5	F-5
Q004	1.9	1.4	1.4	E-5
QA01	0	5.2	0	D-3
QA06	11.9	0	12	G-4
QA07	0	22.5	0	G-4
QA08	11.9	0	12	G-4
QA09	0	24.8	0	G-4
QA10	11.2	11.9	12	G-4
QA11	11.3	0	12	G-4
QB03	6.5	1.4	7.1	E-4
QB04	23.8	20.6	24.5	E-4
QB05	6.6	0	7.2	E-4
QB06	13.1	31.4	12.5	F-4
QB07	8.8	31.4	8.3	F-4
QB08	8.2	0	8.3	F-4
QB09	1.4	8.2	0.7	F-4
QB10	1.2	0.7	0.6	F-4
QB11	0	0.8	0	F-4
QB12	3.6	0	0	D-3
QB13	0	0	0	E-6

Symbol No.	Name	VL			VH			UHF			CATV		
		B	C	E	B	C	E	B	C	E	B	C	E
QA06	RN2202	11.9	0	12	0	11.9	12	11.9	0	12	1.4	11.9	12
QA07	RN1202	0	22.5	0	11.9	0	0	0	22.5	0	11.9	0	0
QA08	RN2202	11.9	0	12	11.9	0	12	11.9	0	12	0.7	11.9	12
QA09	RN1202	0	24.8	0	0	24.5	0	0	24.8	0	11.9	0	0
QA10	2SA1048Y	11.2	11.9	12	11.2	11.8	12	11.9	0	12	11.1	11.7	12
QA11	2SA1048Y	11.3	0	12	11.2	0	12	11.2	11.8	12	11.2	0	12
QB10	2SC2458Y	1.2	0.7	0.6	1.3	0.8	0.7	0	0.8	0.2	1.2	0.7	0.7
QB11	2SC2458Y	0	0.8	0	0	1.7	0	0.7	0	0	0	0.9	0

Symbol No.	Name	Mute ON			Mute OFF		
		B	C	E	B	C	E
QB12	RN1202	0	9.2	0	3.6	0	0
QB13	RN1204	9.2	0	0	0	0	0

Symbol No.	S	G	D	Location
QB01		7.1		E-4
QB02		2.8		E-4

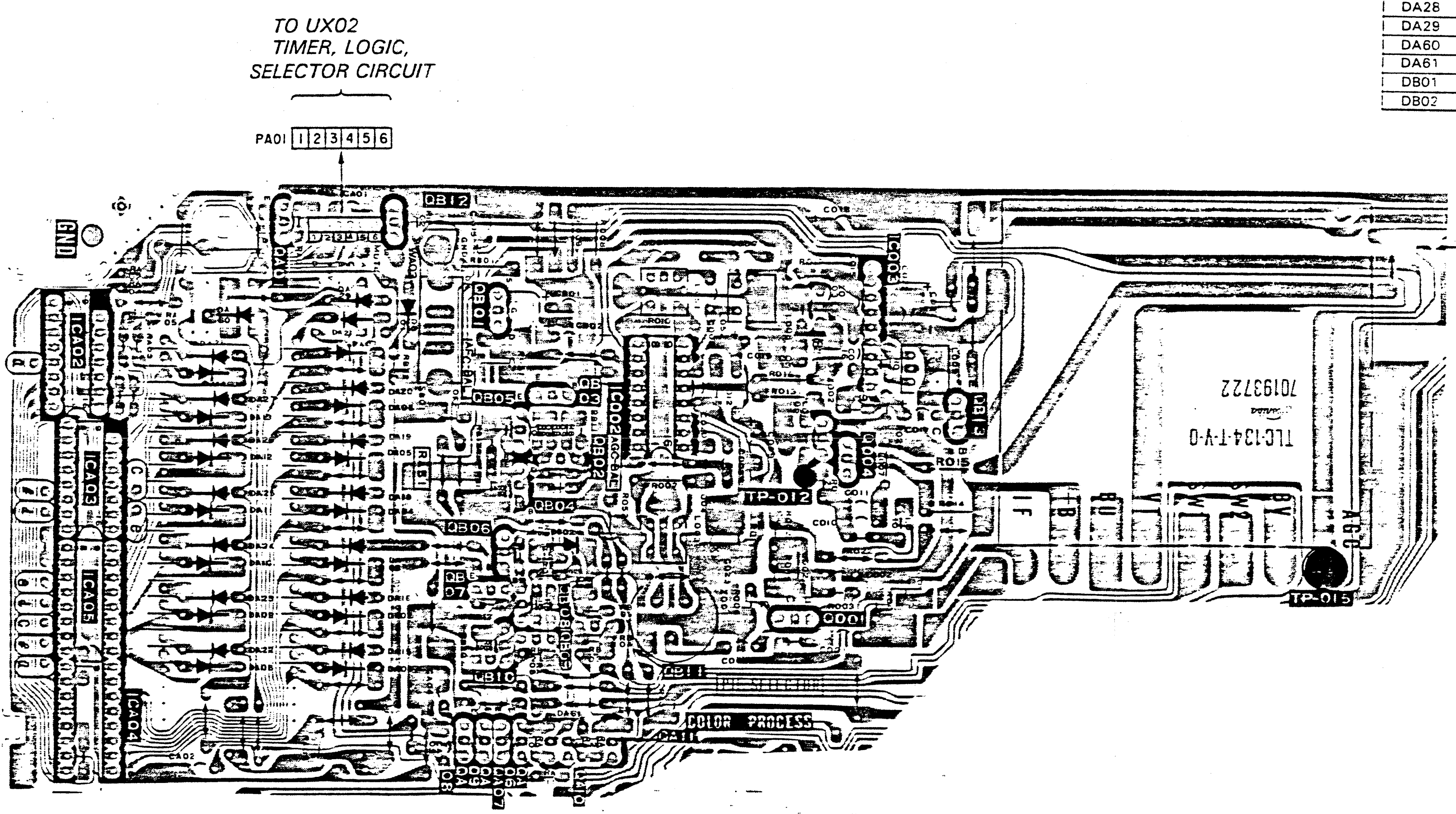
Symbol No.	Name	AFT ON			AFT OFF		
		S	G	D	S	G	D
QB1		6.1	0	7.0	6.5	7.1	6.6

Location of Adjusting VRs

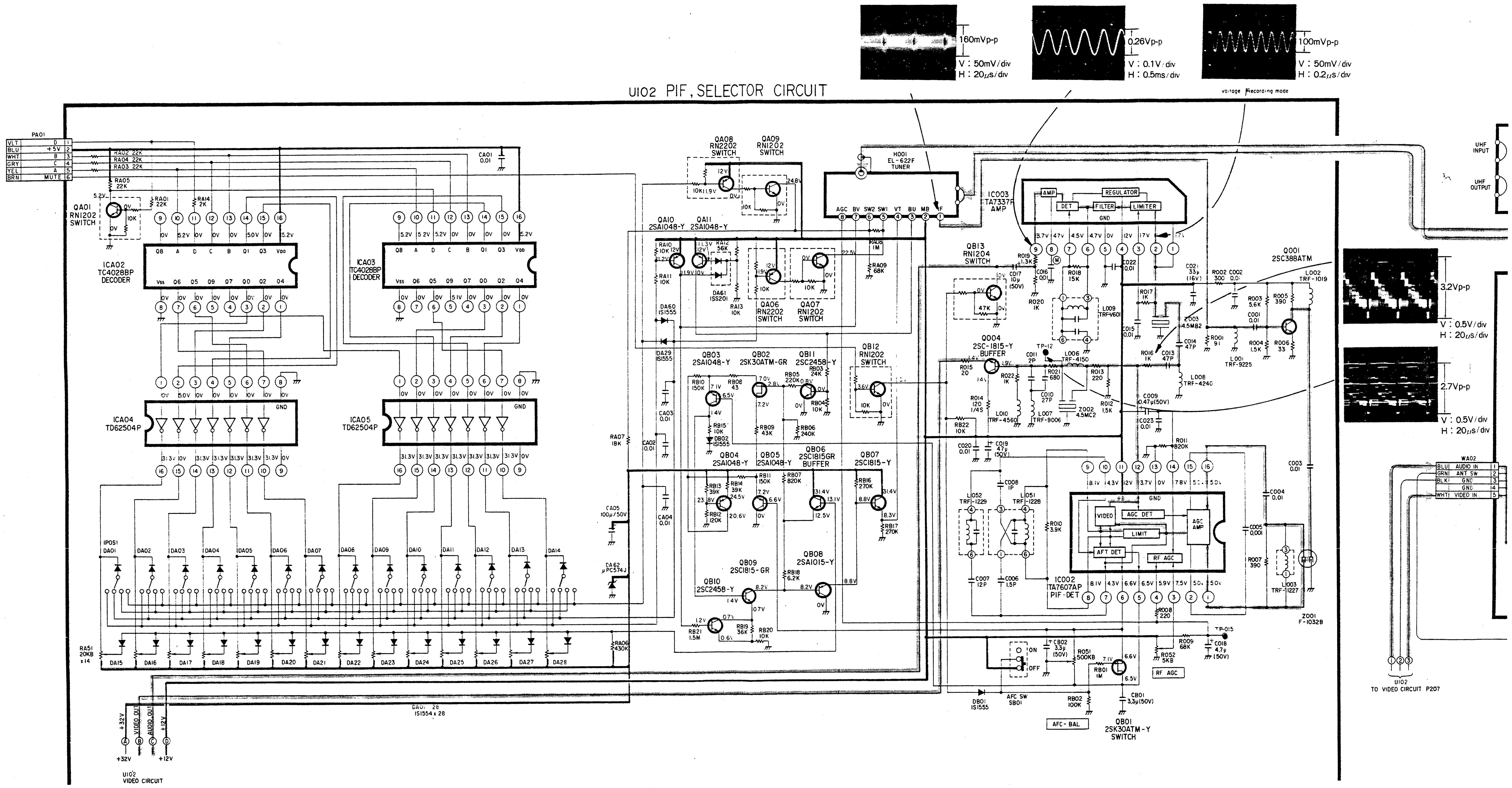
Symbol No.	Location
R051	E-4
R052	F-4

Location of Diodes

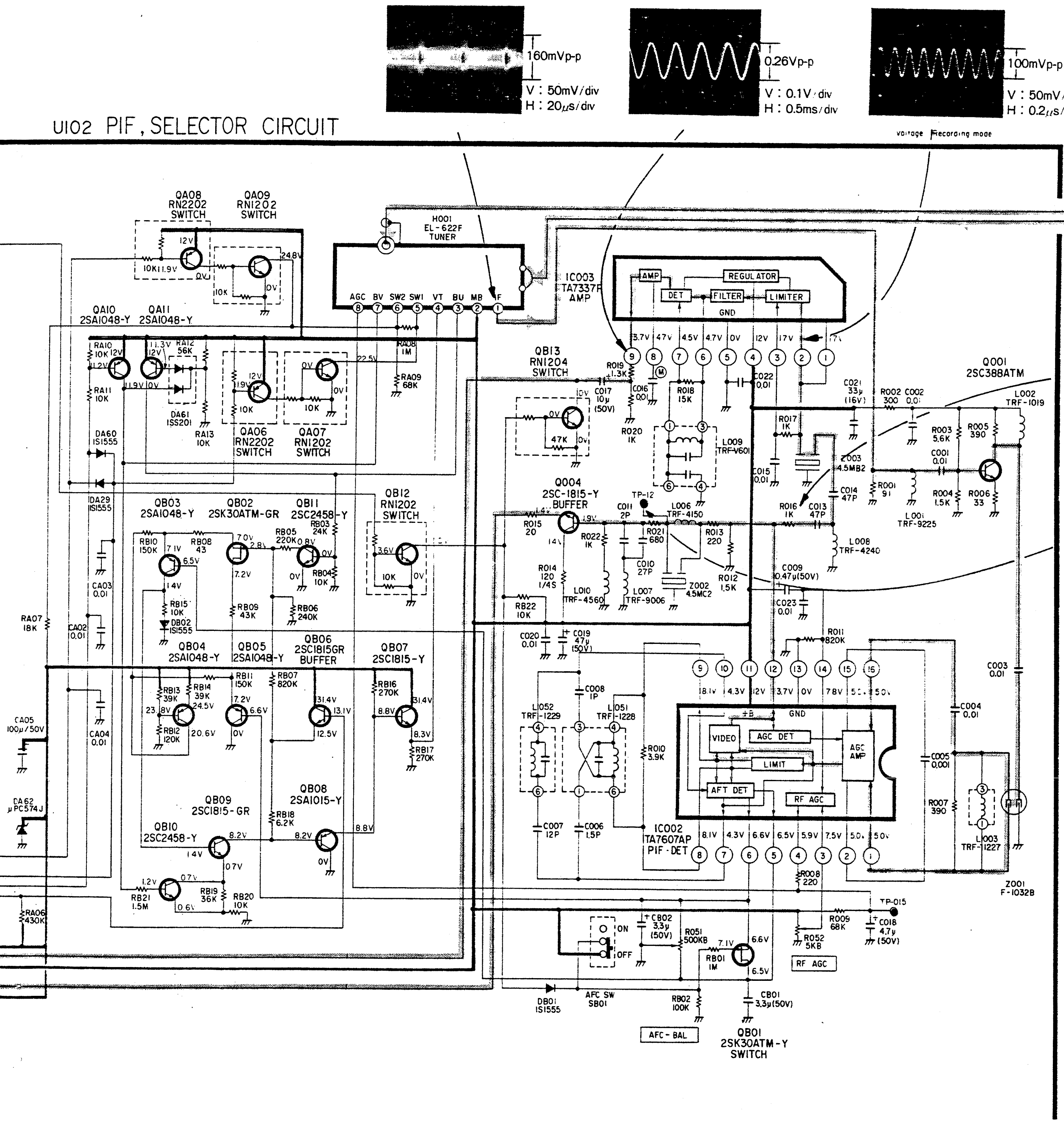
Symbol No.	Location
DA01	F-3
DA02	F-3
DA03	F-3
DA04	F-3
DA05	E-3
DA06	E-3
DA07	E-3
DA08	F-3
DA09	F-3
DA10	F-3
DA11	F-3
DA12	E-3
DA13	E-3
DA14	E-3
DA15	F-3
DA16	F-3
DA17	F-3
DA18	F-3
DA19	E-3
DA20	E-3
DA21	E-3
DA22	F-3
DA23	F-3
DA24	F-3
DA25	E-3
DA26	E-3
DA27	E-3
DA28	E-3
DA29	E-3
DA60	E-3
DA61	G-4
DB01	E-3
DB02	F-4

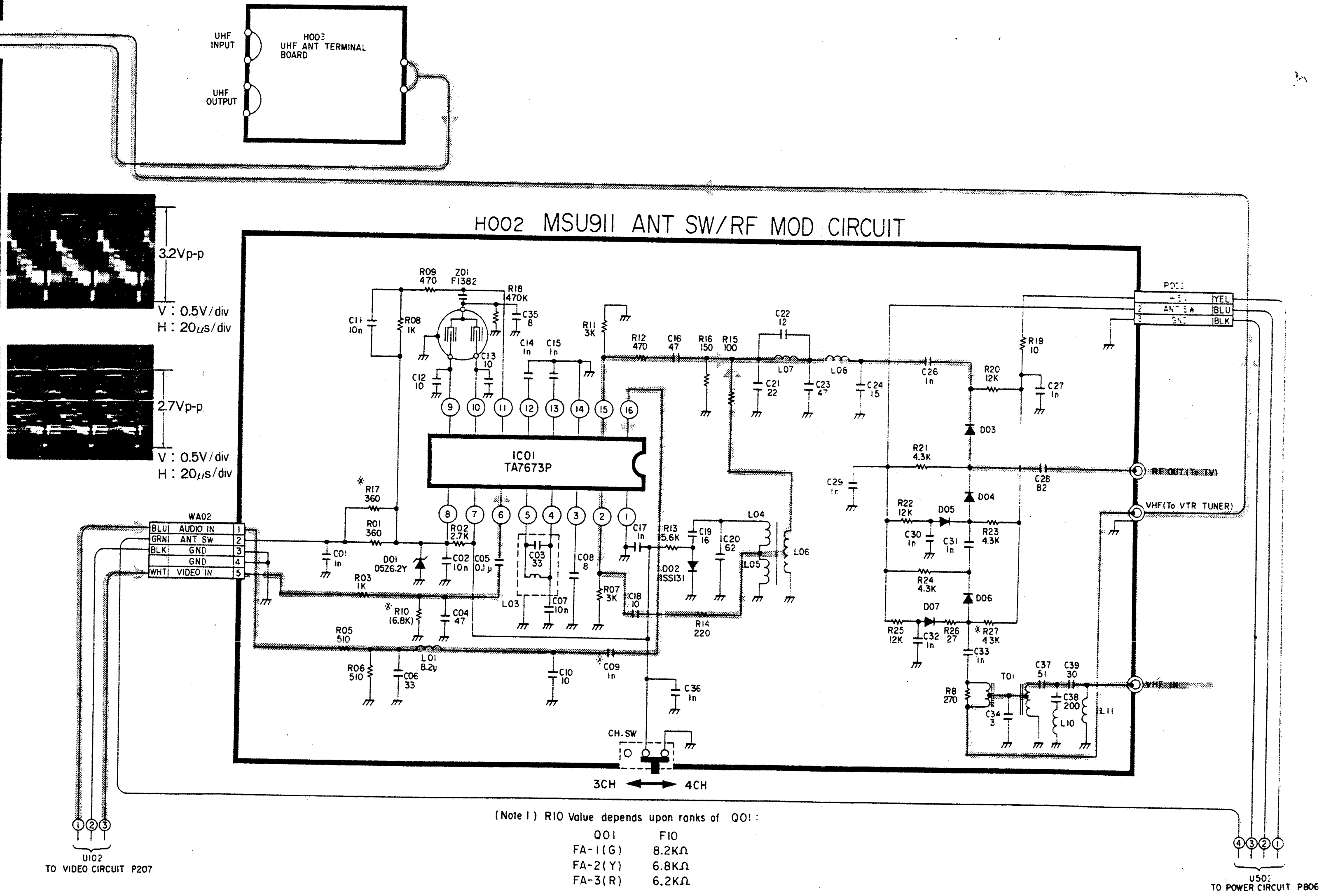

1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT
PA01
1 2 3 4 5 6
GND
QB12
ICA02
ICA03
ICA05
ICA04
QB05
QB04
QB06
IC003
TP-012
TP-015
IF
TLC-134-T-V-0
7019372
Q001
COLOR PROCESS

15. PIF, Channel Selector, Antenna Switch and RF Modulator Circuits


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
U102 PIF, SELECTOR CIRCUIT
160mVp-p
V : 50mV/div
H : 20μs/div
0.26Vp-p
V : 0.1V/div
H : 0.5ms/div
100mVp-p
V : 50mV/div
H : 0.2μs/div
Voltage : Recording mode
3.2Vp-p
V : 0.5V/div
H : 20μs/div
2.7Vp-p
V : 0.5V/div
H : 20μs/div
PA01
VLT D 1
BLU +5V 2
WHT B 3
GRY C 4
YEL A 5
BRN MUTE 6
QA01 RN1202 SWITCH
ICA02 TC4028BP DECODER
ICA03 TC4028BP DECODER
ICA04 TD62504P
ICA05 TD62504P
QA08 RN2202 SWITCH
QA09 RN1202 SWITCH
QA10 2SA1048-Y
QA11 2SA1048-Y
QA06 RN2202 SWITCH
QA07 RN1202 SWITCH
H001 EL-622F TUNER
AGC BV SW2 SW1 VT BU MB IF
IC003 TA7337P AMP
AMP
REGULATOR
DET
FILTER
LIMITER
GND
QB13 RN1204 SWITCH
Q001 2SC388ATM
L002 TRF-1019
QB03 2SA1048-Y
QB02 2SK30ATM-GR
QB11 2SC2458-Y
QB12 RN1202 SWITCH
Q004 2SC-1815-Y BUFFER
QB04 2SA1048-Y
QB05 2SA1048-Y
QB06 2SC1815GR BUFFER
QB07 2SC1815-Y
QB09 2SC1815-GR
QB08 2SA1015-Y
QB10 2SC2458-Y
IC002 TA7607AP PIF·DET
VIDEO
AGC DET
AGC AMP
LIMIT
AFT DET
RF AGC
L052 TRF-1229
L051 TRF-1228
L003 TRF-1227
Z001 F-1032B
Z002 4.5MC2
Z003 4.5MB2
L001 TRF-9225
L008 TRF-4240
L006 TRF-4150
L007 TRF-9006
L010 TRF-4560
L009 TRF-V601
TP-12
TP-015
AFC SW SB01
D801 1S1555
AFC-BAL
QB01 2SK30ATM-Y SWITCH
RF AGC
DA62 μPC574J
IP0S1 DA01
DA02 DA03 DA04 DA05 DA06 DA07 DA08 DA09 DA10 DA11 DA12 DA13 DA14
DA15 DA16 DA17 DA18 DA19 DA20 DA21 DA22 DA23 DA24 DA25 DA26 DA27 DA28
DA01 ~ 28
1S1554 x 28
RA51 20KB x14
+32V VIDEO OUT AUDIO OUT +12V
+32V +12V
U102 VIDEO CIRCUIT
UHF INPUT
UHF OUTPUT
WA02
BLU AUDIO IN 1
GRN ANT SW 2
BLK GND 3
GND 4
WHT VIDEO IN 5
U102 TO VIDEO CIRCUIT P207

or Circuits


U102 PIF, SELECTOR CIRCUIT
160mVp-p
V : 50mV/div
H : 20μs/div
0.26Vp-p
V : 0.1V/div
H : 0.5ms/div
100mVp-p
V : 50mV/div
H : 0.2μs/div
Voltage Recording mode
H001 EL-622F TUNER
AGC BV SW2 SW1 VT BU MB IF
IC003 TA7337F AMP
AMP
REGULATOR
DET
FILTER
LIMITER
GND
QA08 RN2202 SWITCH
QA09 RN1202 SWITCH
QA10 2SA1048-Y
QA11 2SA1048-Y
QA06 RN2202 SWITCH
QA07 RN1202 SWITCH
DA61 1SS201
DA60 1S1555
DA29 1S1555
QB13 RN1204 SWITCH
Q004 2SC-1815-Y BUFFER
Q001 2SC388ATM
QB03 2SA1048-Y
QB02 2SK30ATM-GR
QB11 2SC2458-Y
QB12 RN1202 SWITCH
QB04 2SA1048-Y
QB05 2SA1048-Y
QB06 2SC1815GR BUFFER
QB07 2SC1815-Y
QB09 2SC1815-GR
QB08 2SA1015-Y
QB10 2SC2458-Y
DB02 1S1555
CA62 μPC574J
TP-12
L006 TRF-4150
L009 TRF-V601
L001 TRF-9225
L002 TRF-1019
L008 TRF-4240
L010 TRF-4560
L007 TRF-9006
Z002 4.5MC2
Z003 4.5MB2
L1052 TRF-1229
L1051 TRF-1228
IC002 TA7607AP PIF·DET
VIDEO
AGC DET
AGC AMP
LIMIT
AFT DET
RF AGC
L1003 TRF-1227
Z001 F-1032B
TP-015
AFC SW SB01
DB01 1S1555
AFC-BAL
QB01 2SK30ATM-Y SWITCH
RF AGC


UHF INPUT
UHF OUTPUT
H003 UHF ANT TERMINAL BOARD
3.2Vp-p
V : 0.5V/div
H : 20μs/div
2.7Vp-p
V : 0.5V/div
H : 20μs/div
H002 MSU911 ANT SW/RF MOD CIRCUIT
IC01 TA7673P
WA02
BLU AUDIO IN
GRN ANT SW
BLK GND
GND
WHT VIDEO IN
D01 0526.2Y
D02 1SS131
Z01 F1382
D03
D04
D05
D06
D07
T01
L01 8.2μ
L03
L04
L05
L06
L07
L08
L10
L11
P01
YEL
BLU
BLK
RF OUT (To TV)
VHF (To VTR TUNER)
VHF IN
CH.SW
3CH
4CH
U102 TO VIDEO CIRCUIT P207
U50 TO POWER CIRCUIT P806

(Note 1) R10 Value depends upon ranks of Q01 :

Q01	F10
FA-1(G)	8.2KΩ
FA-2(Y)	6.8KΩ
FA-3(R)	6.2KΩ

(Note2) Unit of fixed resistors is Ohm.

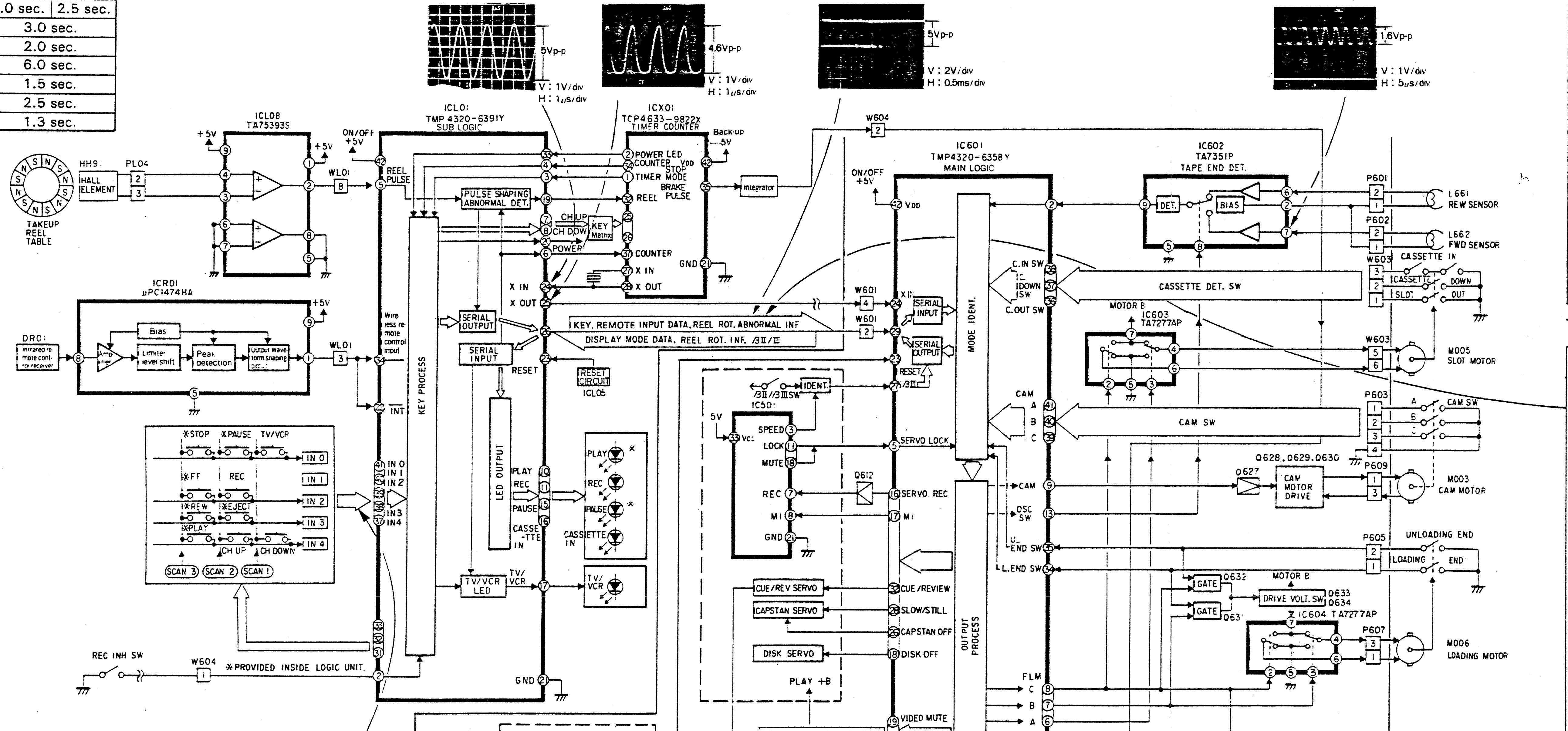
(Note3) Unit of fixed capacitors is PF (unless otherwise noted)
n---(nF) μ---(μF)

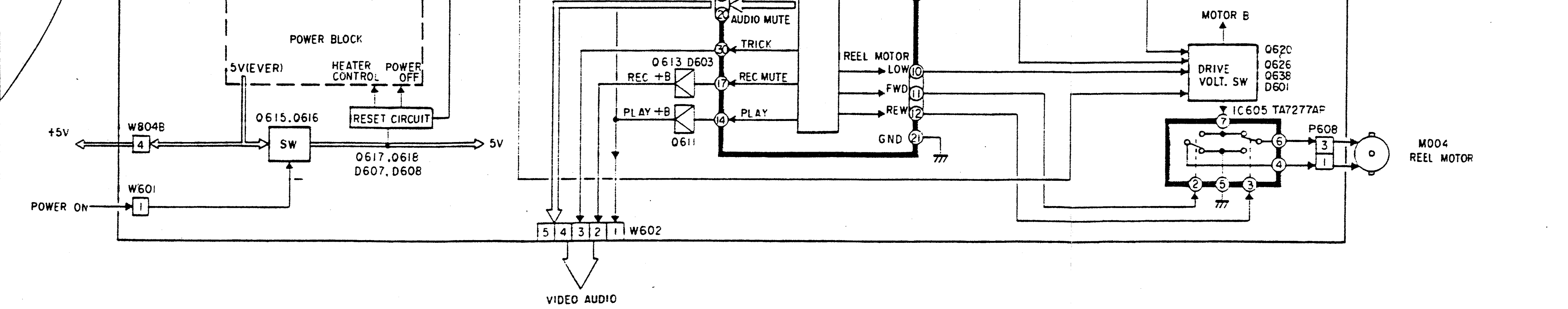
(Note4) Resistors and capacitors marked ·X· have wire leads
Parts with no mark are of tip type.

16. Mechanism and System Control Block Diagram

Table 1 Reel rotation abnormal detection time

Speed / Mode	ßII	ßIII
PLAY	2.0 sec.	2.5 sec.
REC	2.0 sec.	2.5 sec.
SLOW	3.0 sec.	
CUE	2.0 sec.	
REVIEW	6.0 sec.	
FF	1.5 sec.	
REW	2.5 sec.	
Unloading	1.3 sec.	


5Vp-p
V : 1V/div
H : 1μs/div
4.6Vp-p
V : 1V/div
H : 1μs/div
5Vp-p
V : 2V/div
H : 0.5ms/div
1.6Vp-p
V : 1V/div
H : 5μs/div
ICL08
TA75393S
ICL01
TMP 4320-6391Y
SUB LOGIC
ICX01
TCP4633-9822X
TIMER COUNTER
Back-up
5V
IC601
TMP4320-6358Y
MAIN LOGIC
IC602
TA7351P
TAPE END DET.
HH9
HALL ELEMENT
PL04
TAKEUP REEL TABLE
WL01
ON/OFF +5V
REEL PULSE
PULSE SHAPING ABNORMAL DET.
CH UP
CH DOWN
POWER
KEY Matrix
POWER LED
COUNTER
STOP
TIMER MODE
BRAKE
REEL PULSE
COUNTER
X IN
X OUT
GND
Integrator
ICR01
μPC1474HA
DR01
Infrared remote control receiver
Bias
Amp
Limiter level shift
Peak detection
Output wave-form shaping
Wireless remote control input
SERIAL OUTPUT
SERIAL INPUT
RESET
KEY PROCESS
INT
LED OUTPUT
PLAY
REC
PAUSE
CASSETTE IN
TV/VCR LED
TV/VCR
RESET CIRCUIT
ICL05
KEY. REMOTE INPUT DATA. REEL ROT. ABNORMAL INF
DISPLAY MODE DATA. REEL ROT. INF. ßII/ßIII
*STOP
*PAUSE
TV/VCR
*FF
REC
*REW
*EJECT
*PLAY
CH UP
CH DOWN
SCAN 3
SCAN 2
SCAN 1
IN 0
IN 1
IN 2
IN 3
IN 4
W604
W601
X IN
SERIAL INPUT
SERIAL OUTPUT
RESET
ßII/ßIII
MODE IDENT.
IDENT.
ßII/ßIII SW
IC501
SPEED
LOCK
MUTE
REC
MI
GND
SERVO LOCK
SERVO REC
MI
Q612
VDD
C.IN SW
DOWN SW
C.OUT SW
CAM A
B
C
CAM
OSC SW
U. END SW
L. END SW
CUE/REV SERVO
CAPSTAN SERVO
DISK SERVO
CUE/REVIEW
SLOW/STILL
CAPSTAN OFF
DISK OFF
OUTPUT PROCESS
DET.
BIAS
P601
L661 REW SENSOR
P602
L662 FWD SENSOR
W603
CASSETTE IN
CASSETTE DOWN
SLOT
OUT
CASSETTE DET. SW
MOTOR B
IC603
TA7277AP
M005 SLOT MOTOR
P603
CAM SW
CAM SW
Q628, Q629, Q630
Q627
CAM MOTOR DRIVE
P609
M003 CAM MOTOR
P605
UNLOADING END
LOADING
END
GATE
Q632
Q631
MOTOR B
DRIVE VOLT. SW
Q633
Q634
IC604 TA7277AP
P607
M006 LOADING MOTOR
REC INH SW
*PROVIDED INSIDE LOGIC UNIT.


PLAY +B
FLM
C
B
A
VIDEO MUTE
AUDIO MUTE
TRICK
REEL MOTOR
LOW
FWD
REW
GND
REC MUTE
PLAY
Q613 Q603
REC +B
PLAY +B
Q611
POWER BLOCK
5V(EVER)
HEATER CONTROL
POWER OFF
RESET CIRCUIT
Q615, Q616
SW
Q617, Q618
D607, D608
5V
+5V
W804B
W601
POWER ON
MOTOR B
DRIVE VOLT. SW
Q620
Q626
Q638
D601
IC605 TA7277AP
P608
M004 REEL MOTOR
W602
VIDEO AUDIO

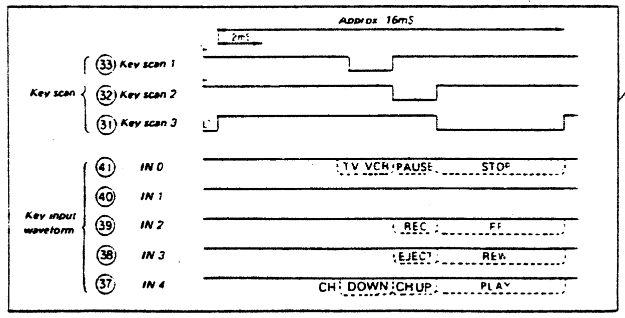


Fig. 1 ICL01 scanning output signal timing (2)

Tabl
Curr
Cass & sc
Slot
Load
Unlo
Stop
FF
REW
CUE
REV
PLA
STIL
REC
REC
Time
Tabl
S
M

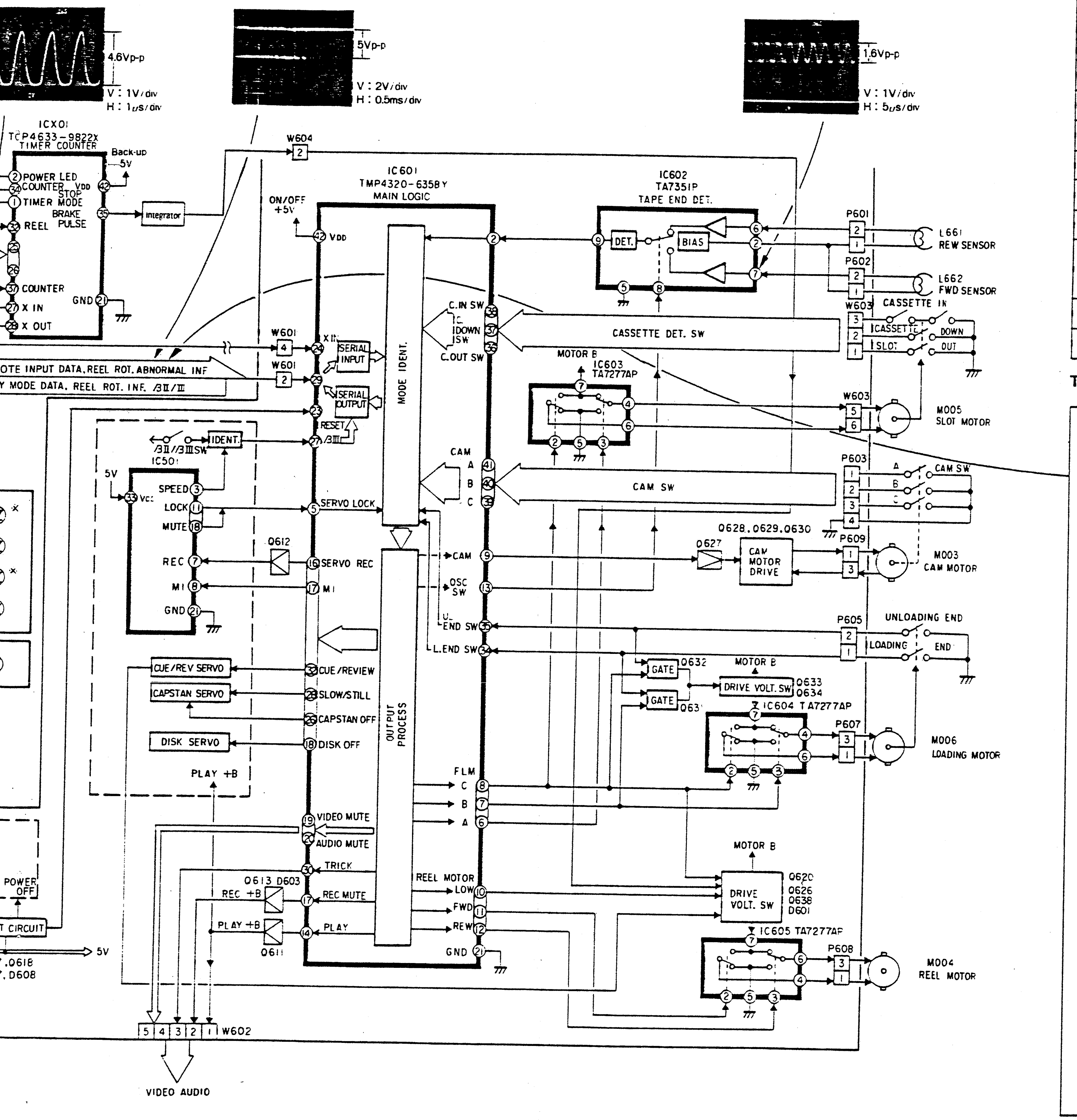

4.6Vp-p
V : 1V/div
H : 1μs/div
5Vp-p
V : 2V/div
H : 0.5ms/div
1.6Vp-p
V : 1V/div
H : 5μs/div
ICX01
TCP4633-9822X
TIMER COUNTER
Back-up 5V
POWER LED
COUNTER STOP
TIMER MODE
REEL PULSE
BRAKE
VDD
COUNTER
X IN
X OUT
GND
Integrator
W604
ON/OFF +5V
IC601
TMP4320-6358Y
MAIN LOGIC
VDD
IC602
TA7351P
TAPE END DET.
DET.
BIAS
P601
L661 REW SENSOR
P602
L662 FWD SENSOR
W603
CASSETTE IN
CASSETTE
SLOT
DOWN
OUT
C.IN SW
DOWN SW
C.OUT SW
CASSETTE DET. SW
MOTOR B
IC603 TA7277AP
W601
SERIAL INPUT
SERIAL OUTPUT
RESET
/βII/βIII
XIN
MODE IDENT.
REMOTE INPUT DATA, REEL ROT. ABNORMAL INF
MODE DATA, REEL ROT. INF. /βII/βIII
IDENT.
βII/βIII SW
IC501
5V
VCC
SPEED
LOCK
MUTE
REC
MI
GND
SERVO LOCK
Q612
SERVO REC
MI
CUE/REV SERVO
CAPSTAN SERVO
DISK SERVO
PLAY +B
CUE/REVIEW
SLOW/STILL
CAPSTAN OFF
DISK OFF
OUTPUT PROCESS
VIDEO MUTE
AUDIO MUTE
TRICK
REC MUTE
PLAY
Q613 D603
REC +B
PLAY +B
Q611
POWER OFF
CIRCUIT
5V
Q618
D608
W602
VIDEO AUDIO
W603
M005 SLOT MOTOR
P603
CAM SW
CAM
CAM SW
Q628, Q629, Q630
Q627
CAM MOTOR DRIVE
P609
M003 CAM MOTOR
OSC SW
U.END SW
L.END SW
P605
UNLOADING END
LOADING
END
GATE
Q632
MOTOR B
DRIVE VOLT. SW
Q633
Q634
Q631
IC604 TA7277AP
P607
M006 LOADING MOTOR
FLM
REEL MOTOR
LOW
FWD
REW
GND
MOTOR B
DRIVE VOLT. SW
Q620
Q626
Q638
D601
IC605 TA7277AP
P608
M004 REEL MOTOR

Table 2 Mode shift table

Input / Current mode	Cassette eject	Stop	FF	REW	PLAY	PAUSE	REC	One touch timer ▭	Abnormal detection: Tape end detection	Abnormal detection: Reel rotation abnormal detection
Cassette open & slot out	x	x	x	x	x	x	x	x	x	x
Slot-in	○	△	△	△	△	x	x	x	x	x
Loading	x	△	△	△	△	x	—	—	x	x
Unloading	x	x	x	x	x	x	x	x	x	Motor stop
Stop	○	—	○	○	○	x	○	—	x	x
FF	○	○	○ Cue	○	○	x	x	○	Rewind	Stop
REW	○	○	○	○ Review	○	x	x	—	Stop	Stop
CUE	○	○	○	○ Review	○	x	x	○	Rewind	Stop
REVIEW	○	○	○ Cue	○	○	x	x	○	Stop	Stop
PLAY	○	○	○ Cue	○ Review	—	○ Still	x	○	Rewind	Stop
STILL	○	○	○ Cue	○ Review	* ○ Slow	○ Play	○ Rec pause (after reversed)	○	Rewind	x
REC	x	○ after reversed	x	x	x	○ Rec pause after reversed	—	—	Rewind	Stop (After reversed)
REC PAUSE	x	○	x	x	x	Rec	x	○	Rewind	x
Timer Rec.	x	x	x	x	x	x	x	—	Stop	Stop (After reversed)

○ . . . . Shift directly to mode specified.

△ . . . . Shift to mode specified after completion of loading.

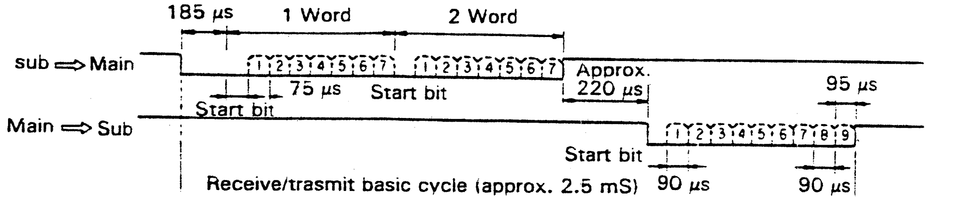
x . . . . Not accept.

(Note)

* . . . . Slow mode as long as PLAY button is being pushed.

Table 3 Serial data transmission format

Basic cycle


185 μs
1 Word
2 Word
sub ⟹ Main
1 2 3 4 5 6 7
1 2 3 4 5 6 7
Approx. 220 μs
75 μs
Start bit
Start bit
95 μs
Main ⟹ Sub
1 2 3 4 5 6 7 8 9
Start bit
Receive/trasmit basic cycle (approx. 2.5 mS)
90 μs
90 μs

Period: Approx. 16mS

Direction	Serial transmission information
Sub → Main	Key & Remote input
	Timer Record
	Reel abnormal direction
Main → Sub	Mode LED display data
	Reel rot. information (counter control)
	Speed data (βII/βIII)
	Cassette-in Display data

Sub → main output format

1 2 3 4 5 6 7

- 7 Key A
- 6 Key B
- 5 Key C
- 4 Key D

Key A–D: Key input data, See right hand table

- 3 Timer record ("H": timer record)
- 2 Not used (always "H")
- 1 Input code ("H": key entry)
- Start bit "L"

Status info. Key info.

- Key A ~ D: No input . . . . dummy code (※2)
  (③ ~ ⑦): INPUT . . . . code equivalent to the input.

Note: Sends (※1) 1 cide at abnormal reel rotation detected.

- Input code ① . . . . Outputs "H" for 1 cycle immediately after the input.

D	C	B	A	Key input
L	L	L	L	Stop
L	L	L	H	——
L	L	H	L	REW
L	L	H	H	——
L	H	L	L	FF
L	H	L	H	※1 Reel rotation abnormal
L	H	H	L	Play
L	H	H	H	Pause
H	L	L	L	——
H	L	L	H	——
H	L	H	L	——
H	L	H	H	——
H	H	L	L	REC
H	H	L	H	※2 Dummy code
H	H	H	L	——
H	H	H	H	Cassette eject

Main → sub output format

1 2 3 4 5 6 7 8 9

- 9 Mode A
- 8 Mode B
- 7 Mode C
- 6 Mode D

Mode A–D: Mode data (see right hand table)

- 5 βIII ("L": βIII)
- 4 Cassette-in ("H": cassette-in LED display)
- 3 Reel on ("L": reel motor rotates)
- 2 Reel reverse: ("H": count down)
- 1 Not used (Always "L")
- Start bit "L"

- ⑥ ~ ⑨ Light up LED (according to mode data)
- ④ Lights up cassette-in LED at "H".
- ③ Detects reel rotation at "L".
- ⑤ Sets abnormal reel rotation time.
- ② Counts up at "L", and counts down at "H".

Mode data: D	Mode data: C	Mode data: B	Mode data: A	Mode	Mode LED indicator	ICL01 output: 10	ICL01 output: 11	ICL01 output: 15
L	L	L	L	Stop	None	H	H	H
L	L	L	H	(Not used)	——	—	—	—
L	L	H	L	REW	None	H	H	H
L	L	H	H	REVIEW	Play	L	H	H
L	H	L	L	FF	None	H	H	H
L	H	L	H	Cue	Play	L	H	H
L	H	H	L	Play	Play	L	H	H
L	H	H	H	Still	Play, Pause	L	H	L
H	L	L	L	(Not used)	——	—	—	—
H	L	L	H	(Not used)	——	—	—	—
H	L	H	L	(Not used)	——	—	—	—
H	L	H	H	(Not used)	——	—	—	—
H	H	L	L	Rec	Rec	H	L	H
H	H	L	H	Rec pause	Rec, Pause	H	L	L
H	H	H	L	Slow	Play, Pause	L	H	L
H	H	H	H	Eject	None	H	H	H

Logic Microcomputer

Logic Main Microcomputer (TMP4320-6358Y)

Mode	A	B	C
Motor off	H	H	H
Slot-in	L	H	H
Slot-out	H	L	L
Loading	H	L	H
Unloading	L	H	L

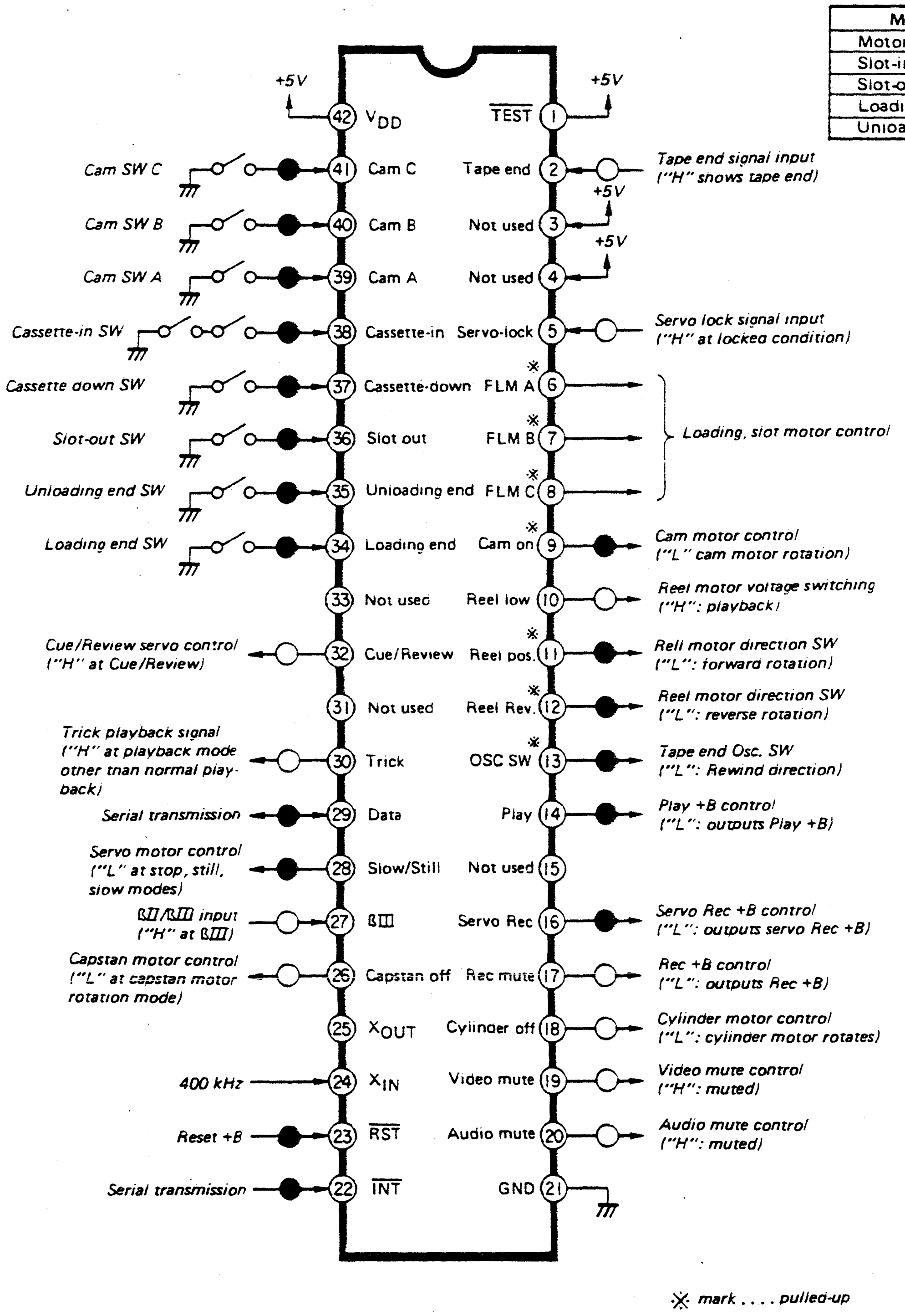

+5V
+5V
42 VDD
TEST 1
Cam SW C
41 Cam C
Tape end 2
Tape end signal input ("H" shows tape end)
Cam SW B
40 Cam B
Not used 3
+5V
Cam SW A
39 Cam A
Not used 4
+5V
Cassette-in SW
38 Cassette-in
Servo-lock 5
Servo lock signal input ("H" at locked condition)
Cassette down SW
37 Cassette-down
FLM A 6
Slot-out SW
36 Slot out
FLM B 7
Loading, slot motor control
Unloading end SW
35 Unloading end
FLM C 8
Loading end SW
34 Loading end
Cam on 9
Cam motor control ("L" cam motor rotation)
33 Not used
Reel low 10
Reel motor voltage switching ("H": playback)
Cue/Review servo control ("H" at Cue/Review)
32 Cue/Review
Reel pos. 11
Reel motor direction SW ("L": forward rotation)
31 Not used
Reel Rev. 12
Reel motor direction SW ("L": reverse rotation)
Trick playback signal ("H" at playback mode other than normal play-back)
30 Trick
OSC SW 13
Tape end Osc. SW ("L": Rewind direction)
Serial transmission
29 Data
Play 14
Play +B control ("L": outputs Play +B)
Servo motor control ("L" at stop, still, slow modes)
28 Slow/Still
Not used 15
ᗷ/ᗷ input ("H" at ᗷ)
27 ᗷ
Servo Rec 16
Servo Rec +B control ("L": outputs servo Rec +B)
Capstan motor control ("L" at capstan motor rotation mode)
26 Capstan off
Rec mute 17
Rec +B control ("L": outputs Rec +B)
25 XOUT
Cylinder off 18
Cylinder motor control ("L": cylinder motor rotates)
400 kHz
24 XIN
Video mute 19
Video mute control ("H": muted)
Reset +B
23 RST
Audio mute 20
Audio mute control ("H": muted)
Serial transmission
22 INT
GND 21
※ mark .... pulled-up

Fig. 3 Functions of terminals, TMP4320-6358Y

Table 4 IC601 (TMP4320-6358Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec pause	Re-verse
6	FLM A	L	H	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H
7	FLM B	L	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H
8	FLM C	L	H	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H
9	Cam On	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H
10	Reel low	H	L	L	L	L	L	L	L	L	L	L	*H	*H	*H	*H	L	L
11	Reel pos.	L	H	H	H	H	L	H	L	H	L	H	H	H	H	H	H	H
12	Reel rev.	L	H	H	H	H	H	H	H	L	H	L	L	L	L	L	H	⊓⊓⊓
13	Osc sw.	L	H	H	H	H	H	H	H	L	H	L	H	H	H	H	H	L
14	Play	L	H	H	H	H	H	H	H	H	L	L	L	L	L	H	H	H
15	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
16	Servo Rec	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
17	Rec mute	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H
18	Cylinder off	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L
19	Video mute	H	L	L	L	L	L	L	L	L	L	L	*⊓	L	L	L	L	L
20	Audio mute	H	L	L	L	L	L	L	L	L	H	H	*⊓	H	H	L	L	L
33	Not used	H	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	H
32	Cue/Review	H	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L
31	Not used	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
30	Trick	H	L	L	L	L	L	L	L	L	H	H	L	H	H	L	L	L
28	Still·Slow	L	L	L	L	L	L	L	H	H	H	H	H	L	L	H	H	L
26	Capstan Off	H	H	H	H	H	H	H	H	H	H	H	L	H	⊓⊓⊓	L	L	H
39	Cam A	–	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
40	Cam B	–	H	H	H	L	H	H	L	L	L	L	L	L	L	L	H	L
41	Cam C	–	L	L	L	H	H	L	H	H	H	H	L	L	L	L	L	H
Cam position		–	III	III	III	II	I	III	II	II	II	II	IV	IV	IV	IV	III	II

NOTE: *H=0.7V, ※ pin 5 input ("H" at servo Lock "L")

Table 5 ICL01(TMP4320-6391Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec Pause	Note
6	Count up	H	H	H	H	L	H	H	H	L	H	L	H	H	H	H	H	"L" during reverse.
7	CH up	L	•	•	•	•	•	•	•	•	•	•	•	•	•	L	•	* : "L" with CH-up button being pushed.
8	CH down	L	•	•	•	•	•	•	•	•	•	•	•	•	•	L	•	* : "L" with CH-Dn button being pushed.
9	LED select	H	H	H	L	H	L	H	H	H	H	H	H	H	H	L	L	
10	Play LED	L	H	△	H	△	H	H	H	H	L	L	L	L	L	H	H	△ : "L" in Play mode.
11	Rec LED	L	H	H	H	△	H	H	H	H	H	H	H	H	H	L	L	△ : "L" in Rec mode.
12	Not used	L	H	△	H	△	H	H	L	H	L	H	H	H	H	H	H	△ : "L" in FF/Cue mode.
13	Not used	L	H	–	L	△	L	H	H		H	L	H	H	H	H	H	△ : "L" in REW/Review mode.
14	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
15	Pause LED	L	H	△	H	△	H	H	H	H	H	H	H	L	L	H	L	△ : "L" in Still, Rec pause mode.
16	Cassette-in LED	L	H	⊓⊓	⊓⊓	⊓⊓	⊓⊓	L	L	L	L	L	L	L	L	L	L	
17	Antenna LED	L	*	*	*	*	*	*	*	*	*□	*□	*□	*□	*	*	*	* : Output reversed when TV/VCR button is pushed. □ : "L" during mode shift.
18	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
20	POWER ON/OFF	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	★
Lights up LED	Play	–		–		△					○	○	○	○	○			○ : Light-up △ : Light-up depending mode.
	Pause	–		△		△								○	○		○	
	Rec	–				△										○	○	
	Cassette-in	–		Blinks	Blinks	Blinks	Blinks	○	○	○	○	○	○	○	○	○	○	

NOTE : ★"L" Output when wireless power button is pushed.

Table 4 IC601 (TMP4320-6358Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec pause	Re-verse
6	FLM A	L	H	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H
7	FLM B	L	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H
8	FLM C	L	H	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H
9	Cam On	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H
10	Reel low	H	L	L	L	L	L	L	L	L	L	L	*H	*H	*H	*H	L	L
11	Reel pos.	L	H	H	H	H	L	H	L	H	L	H	H	H	H	H	H	H
12	Reel rev.	L	H	H	H	H	H	H	H	L	H	L	L	L	L	L	H	⊓⊓⊓
13	Osc sw.	L	H	H	H	H	H	H	H	L	H	L	H	H	H	H	H	L
14	Play	L	H	H	H	H	H	H	H	H	L	L	L	L	L	H	H	H
15	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
16	Servo Rec	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
17	Rec mute	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H
18	Cylinder off	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L
19	Video mute	H	L	L	L	L	L	L	L	L	L	L	※⊓	L	L	L	L	L
20	Audio mute	H	L	L	L	L	L	L	L	L	H	H	※⊓	H	H	L	L	L
33	Not used	H	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	H
32	Cue/Review	H	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L
31	Not used	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
30	Trick	H	L	L	L	L	L	L	L	L	H	H	L	H	H	L	L	L
28	Still·Slow	L	L	L	L	L	L	L	H	H	H	H	H	L	L	H	H	L
26	Capstan Off	H	H	H	H	H	H	H	H	H	H	H	L	H	⊓⊓	L	L	H
39	Cam A	—	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
40	Cam B	—	H	H	H	L	H	H	L	L	L	L	L	L	L	L	H	L
41	Cam C	—	L	L	L	H	H	L	H	H	H	H	L	L	L	L	L	H
	Cam position	—	III	III	III	II	I	III	II	II	II	II	IV	IV	IV	IV	III	II

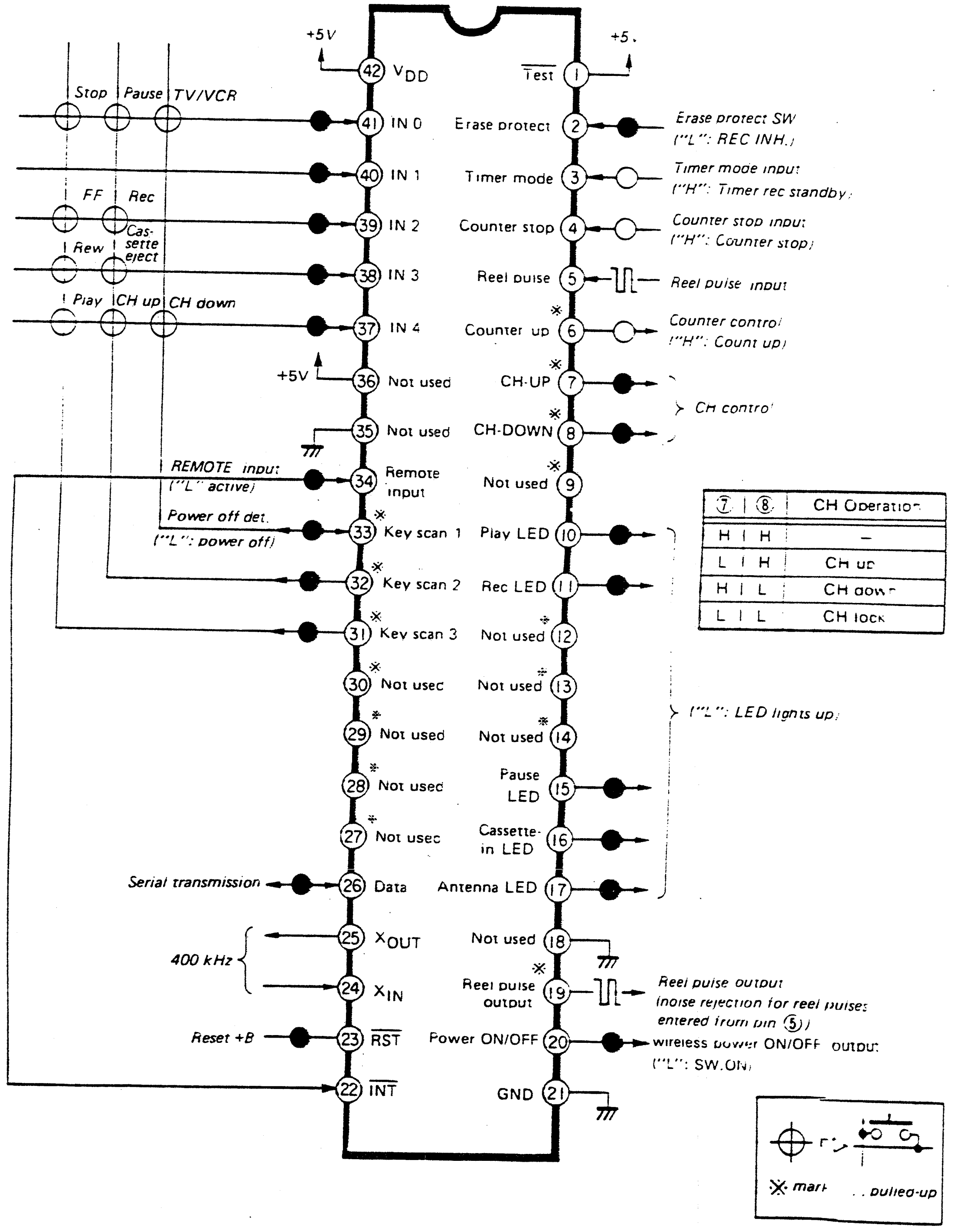
NOTE : *H=0.7V, ※ pin 5 input ("H" at servo Lock "L")

Table 5 ICL01(TMP4320-6391Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec Pause	Note
6	Count up	H	H	H	H	L	H	H	H	L	H	L	H	H	H	H	H	"L" during reverse.
7	CH up	L	•	•	•	•	•	•	•	•	•	•	•	•	•	L	•	• : "L" with CH-up button being pushed.
8	CH down	L	•	•	•	•	•	•	•	•	•	•	•	•	•	L	•	• : "L" with CH-Dn button being pushed.
9	LED select	H	H	H	L	H	L	H	H	H	H	H	H	H	H	L	L	
10	Play LED	L	H	△	H	△	H	H	H	H	L	L	L	L	L	H	H	△ : "L" in Play mode.
11	Rec LED	L	H	H	H	△	H	H	H	H	H	H	H	H	H	L	L	△ : "L" in Rec mode.
12	Not used	L	H	△	H	△	H	H	L	H	L	H	H	H	H	H	H	△ : "L" in FF/Cue mode.
13	Not used	L	H	△	L	△	L	H	H		H	L	H	H	H	H	H	△ : "L" in REW/Review mode.
14	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
15	Pause LED	L	H	△	H	△	H	H	H	H	H	H	H	L	L	H	L	△ : "L" in Still, Rec pause mode.
16	Cassette-in LED	L	H	⊓⊓	⊓⊓	⊓⊓	⊓⊓	L	L	L	L	L	L	L	L	L	L	
17	Antenna LED	L	✱	✱	✱	✱	✱	✱	✱	✱	✱□	✱□	✱□	✱□	✱	✱	✱	✱ : Output reversed when TV/VCR button is pushed. □ : "L" during mode shift.
18	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
20	POWER ON/OFF	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	★
Lights up LED	Play	—		△		△					○	○	○	○	○			○ : Light-up
	Pause	—		△		△								○	○		○	
	Rec	—				△										○	○	△ : Light-up depending mode.
	Cassette-in	—		Blinks	Blinks	Blinks	Blinks	○	○	○	○	○	○	○	○	○	○	

NOTE : ★"L" Output when wireless power button is pushed.

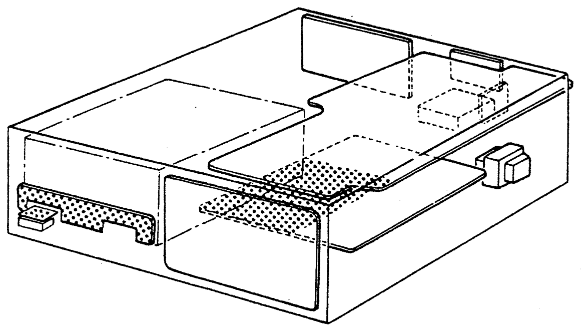
Logic Sub-microcomputer (TMP4320-6391Y)

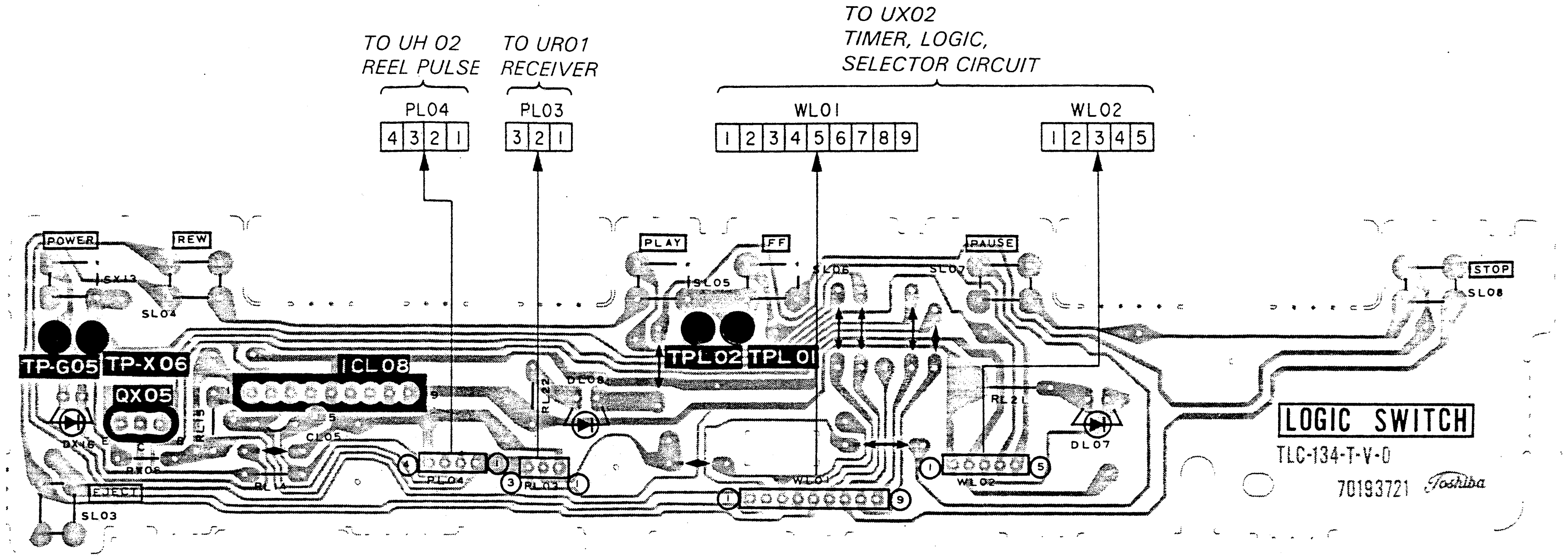

+5V
42 VDD
+5V
Test 1
Stop
Pause
TV/VCR
41 IN 0
Erase protect 2
Erase protect SW ("L": REC INH.)
40 IN 1
Timer mode 3
Timer mode input ("H": Timer rec standby)
FF
Rec
39 IN 2
Counter stop 4
Counter stop input ("H": Counter stop)
Rew
Cas-sette eject
38 IN 3
Reel pulse 5
Reel pulse input
Play
CH up
CH down
37 IN 4
※ Counter up 6
Counter control ("H": Count up)
+5V
36 Not used
※ CH-UP 7
CH control
35 Not used
※ CH-DOWN 8
REMOTE input ("L" active)
34 Remote input
※ Not used 9
Power off det. ("L": power off)
※ 33 Key scan 1
Play LED 10
※ 32 Key scan 2
Rec LED 11
※ 31 Key scan 3
※ Not used 12
※ 30 Not used
※ Not used 13
("L": LED lights up)
※ 29 Not used
※ Not used 14
※ 28 Not used
Pause LED 15
※ 27 Not used
Cassette-in LED 16
Serial transmission
26 Data
Antenna LED 17
400 kHz
25 XOUT
Not used 18
24 XIN
※ Reel pulse output 19
Reel pulse output (noise rejection for reel pulses entered from pin ⑤)
Reset +B
23 RST
Power ON/OFF 20
wireless power ON/OFF output ("L": SW.ON)
22 INT
GND 21
※ mark
pulled-up

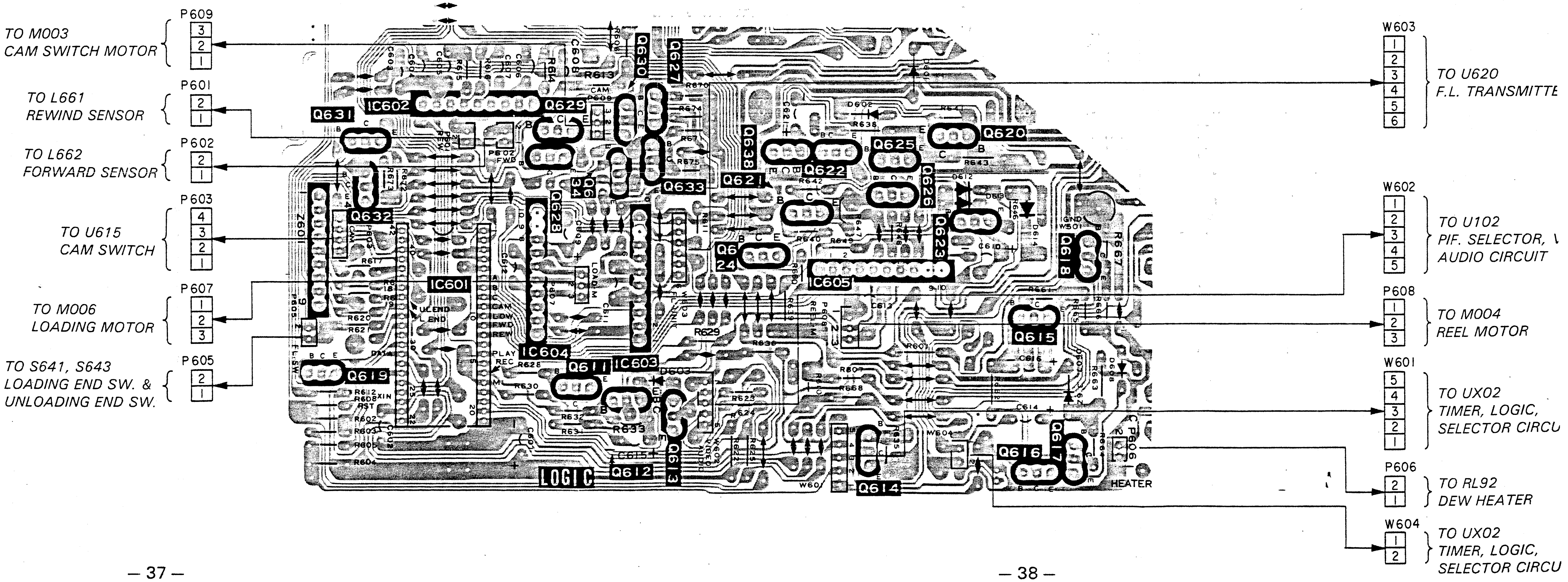
⑦	⑧	CH Operation
H	H	—
L	H	CH up
H	L	CH down
L	L	CH lock

Fig. 4 Function of terminals, TMP4320-6391Y

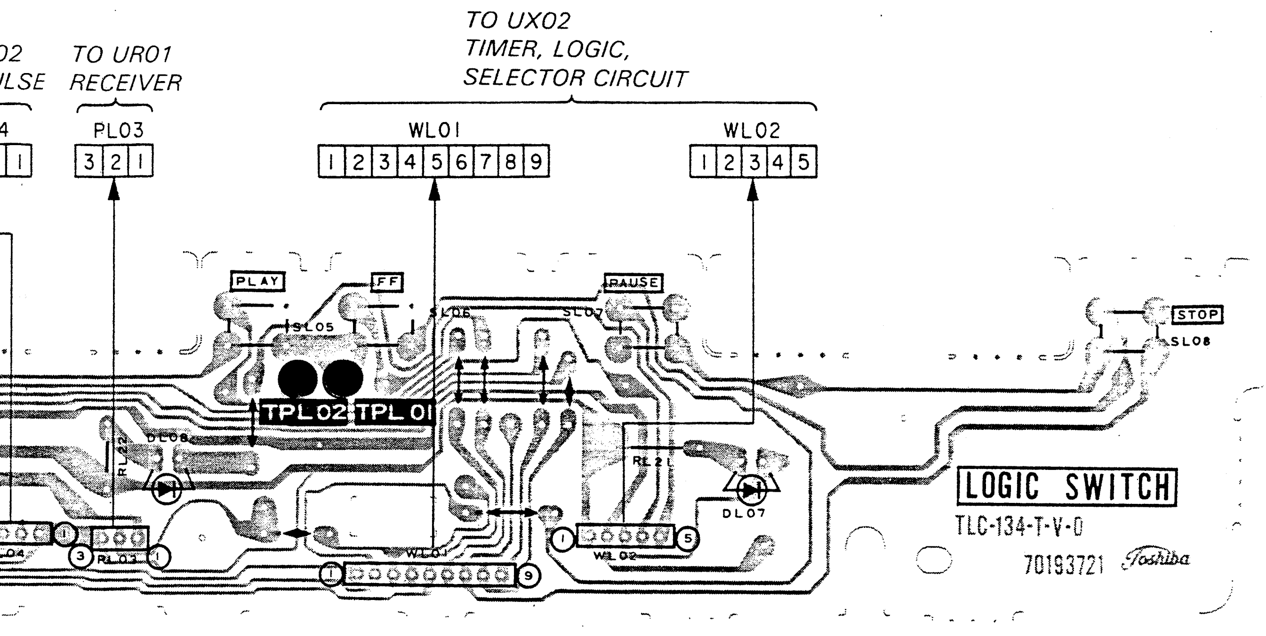
17. Logic PC Board

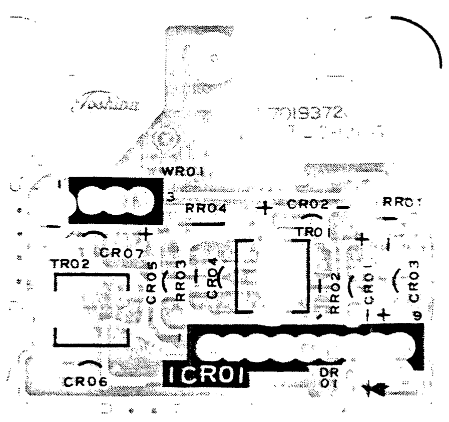


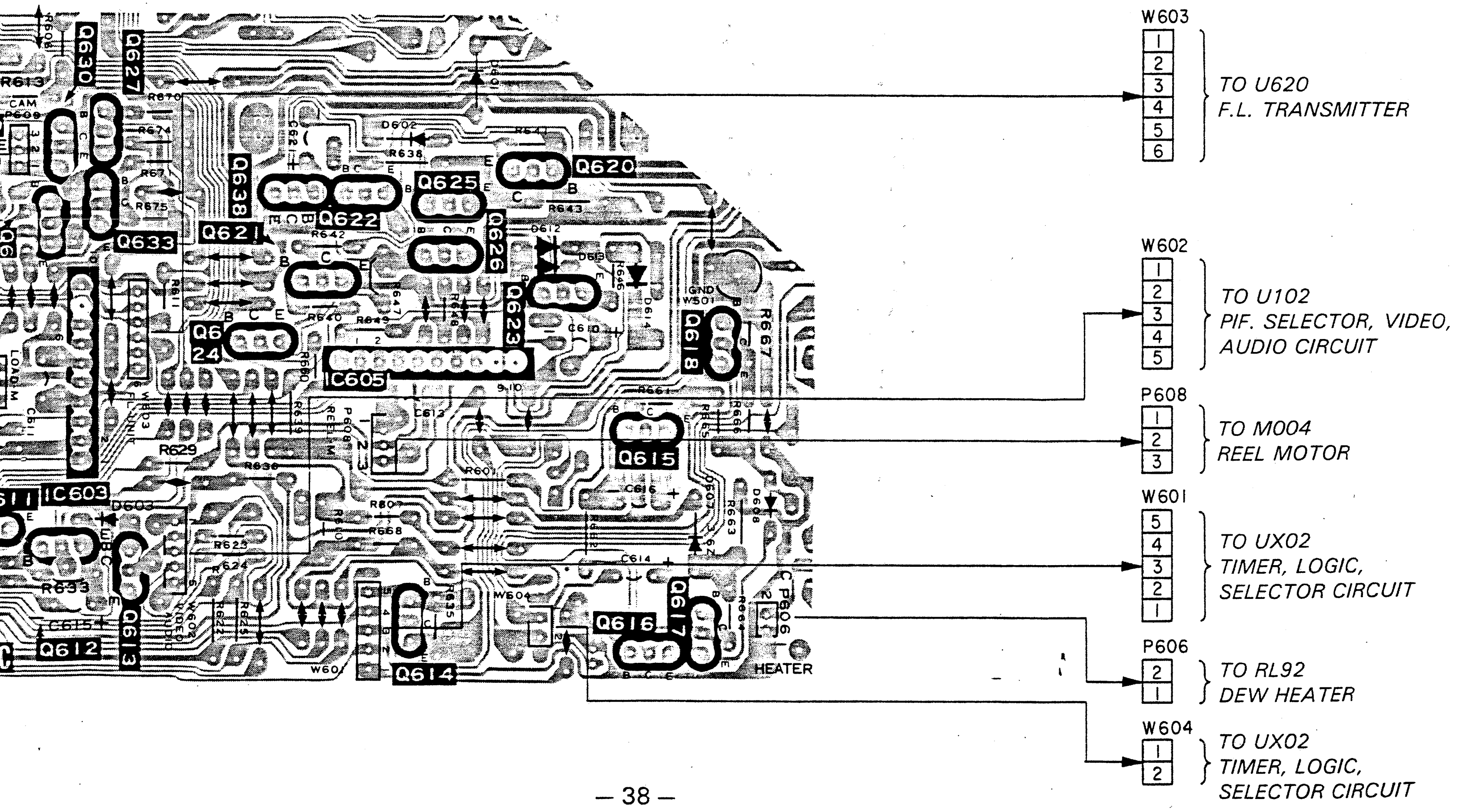

TO UH 02
REEL PULSE
TO URO1
RECEIVER
TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT
PL04
4 3 2 1
PL03
3 2 1
WL01
1 2 3 4 5 6 7 8 9
WL02
1 2 3 4 5
POWER
REW
PLAY
FF
PAUSE
STOP
EJECT
SL03
SL04
SL05
SL06
SL07
SL08
TP-G05
TP-X06
QX05
ICL08
TPL02
TPL01
DL07
DL08
RL21
LOGIC SWITCH
TLC-134-T-V-0
70193721
Toshiba


TO M003
CAM SWITCH MOTOR
P609
3 2 1
TO L661
REWIND SENSOR
P601
2 1
TO L662
FORWARD SENSOR
P602
2 1
TO U615
CAM SWITCH
P603
4 3 2 1
TO M006
LOADING MOTOR
P607
1 2 3
TO S641, S643
LOADING END SW. &
UNLOADING END SW.
P605
2 1
IC601
IC602
IC603
IC604
IC605
Q611
Q612
Q613
Q614
Q615
Q616
Q617
Q618
Q619
Q620
Q621
Q622
Q623
Q624
Q625
Q626
Q627
Q628
Q629
Q630
Q631
Q632
Q633
Q634
Q638
LOGIC
HEATER
W603
1 2 3 4 5 6
TO U620
F.L. TRANSMITTE
W602
1 2 3 4 5
TO U102
PIF. SELECTOR, \
AUDIO CIRCUIT
P608
1 2 3
TO M004
REEL MOTOR
W601
5 4 3 2 1
TO UX02
TIMER, LOGIC,
SELECTOR CIRCU
P606
2 1
TO RL92
DEW HEATER
W604
1 2
TO UX02
TIMER, LOGIC,
SELECTOR CIRCU

6 7 8 9 10 11 12 13 14 15 16


TO UR01
RECEIVER
TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT
PL03
WL01
WL02
PLAY
FF
PAUSE
STOP
SL05
SL06
SL07
SL08
TPL02
TPL01
DL08
DL07
RL21
RL03
WL01
WL02
LOGIC SWITCH
TLC-134-T-V-0
70193721
Toshiba


Toshiba
70193721
WR01
RR04
CR02
RR01
TR01
CR07
TR02
CR05
RR03
CR04
RR02
CR01
CR03
CR06
ICR01
DR01


Q630
Q627
R613
Q638
Q625
Q620
Q622
Q621
Q633
Q626
Q623
Q624
IC605
Q618
Q615
IC603
R629
R633
C615
Q612
Q613
Q614
Q616
Q617
HEATER
W603
TO U620
F.L. TRANSMITTER
W602
TO U102
PIF. SELECTOR, VIDEO,
AUDIO CIRCUIT
P608
TO M004
REEL MOTOR
W601
TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT
P606
TO RL92
DEW HEATER
W604
TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT

1. Logic SW circuit

Location of Digital Transistors

Symbol No.	Location
QX05	C-4
QL08	B-5

Location of Diodes

Symbol No.	Location
DX16	C-4
DL07	C-9
DL08	C-6

Voltage

V : Rec mode
(V) : Play mode

Symbol No.	B	C	E
QX05	5.1	0.1	0
QL02	5.0	4.9	4.8

2. Main logic circuit

Location of ICs

Symbol No.	Location
IC601	F-5
IC602	E-5
IC603	F-6
IC604	F-5
IC605	F-7

Location of Diodes

Symbol No.	Location
D601	E-8
D602	E-8
D603	G-6
D607	G-9
D608	G-9
D612	E-8
D613	E-8
D614	E-8

Location of Transistors

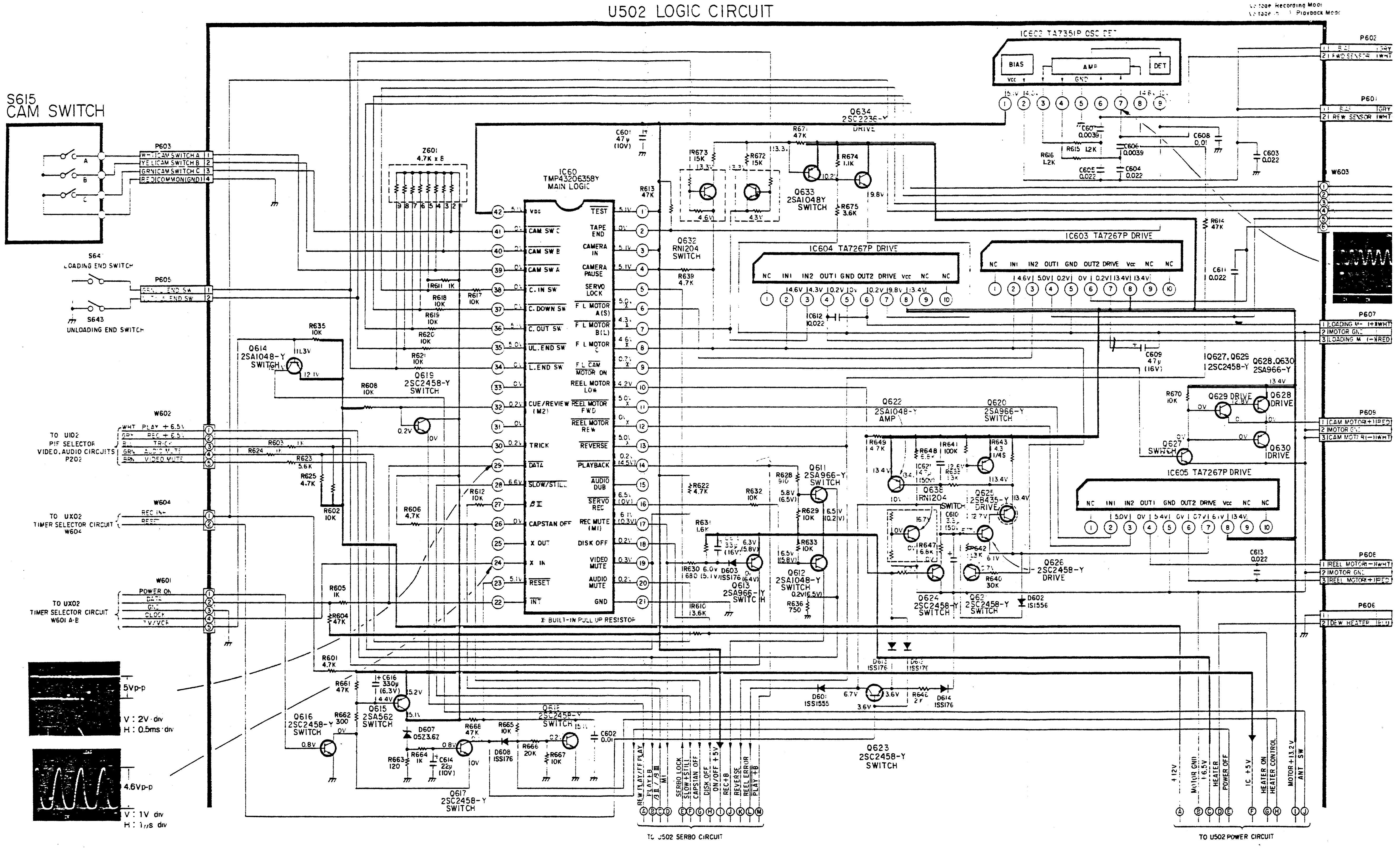
Symbol No.	Location
Q611	G-6
Q612	G-6
Q613	G-6
Q614	G-8
Q615	F-9
Q616	G-9
Q617	G-9
Q618	F-9
Q619	F-4
Q620	E-8
Q621	F-7
Q622	E-7
Q623	F-8
Q624	F-7
Q625	E-8
Q626	E-8
Q627	E-6
Q628	E-5
Q629	E-5
Q630	E-6
Q631	E-4
Q632	E-4
Q633	E-6
Q634	E-6
Q638	E-7

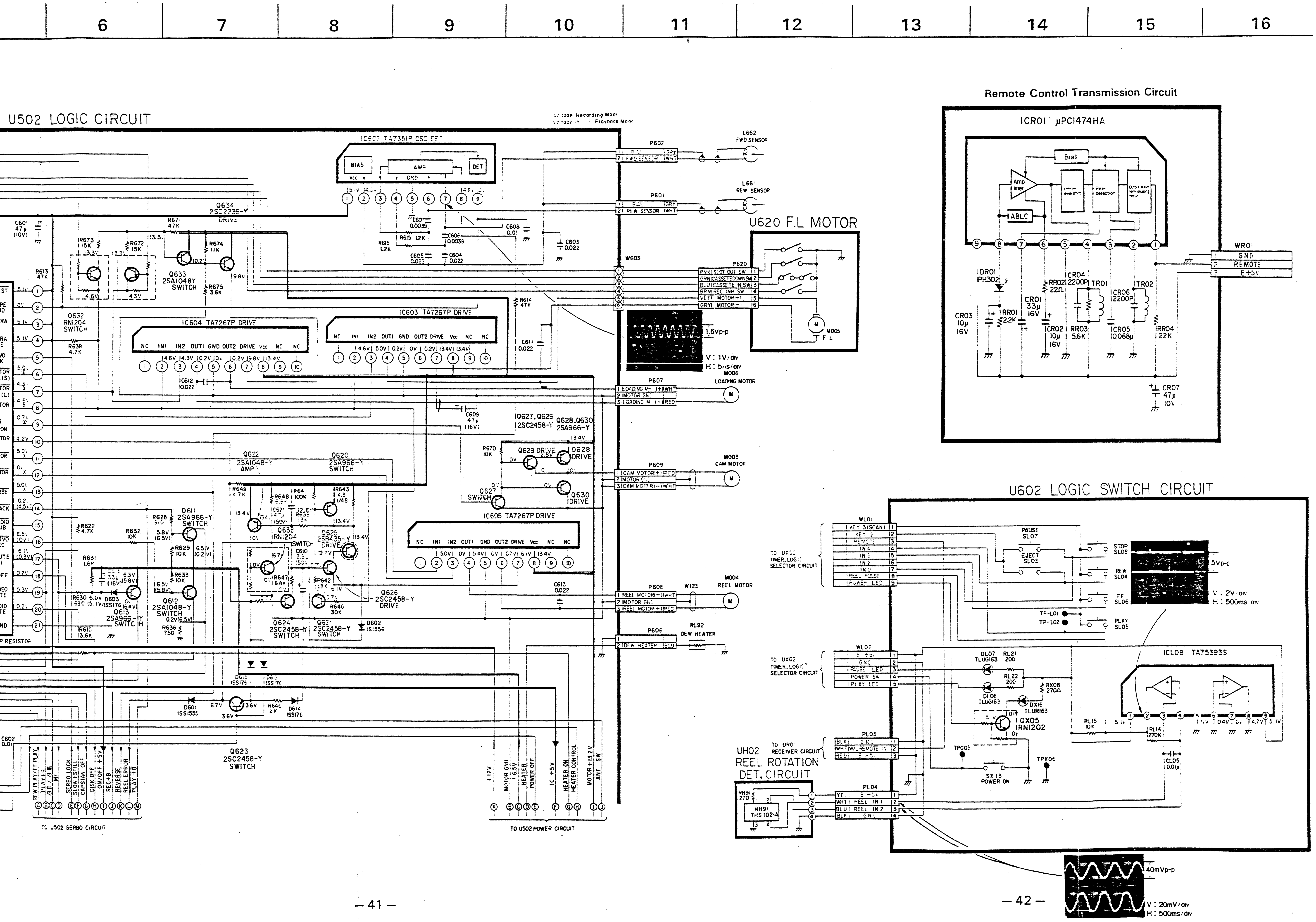
Voltage

V : Rec mode
(V) : Play mode

	B	C	E
Q611	5.8 (6.5)	6.5 (0.2	6.5
Q612	6.5 (5.8)	0.2 (6.5	6.5
Q613	6.3V (5.8)	0 (6.4	6.5
Q614	11.3	12.1	12.1
Q615	4.4	5.1	5.2
Q616	0.8	0.1	0
Q617	0.8	0	0
Q618	0.2	5.1	0
Q619	0.2	5.1	0
Q620	12.6	13.4	13.4
Q621	0.7	0.1	0
Q622	13.4	0	13.4
Q623	3.6	6.7	3.6
Q624	0.7	0	0
Q625	12.7	6.1	13.4
Q626	6.7	12.7	6.1
Q627	0.7	0	0
Q628	12.8	0	13.4
Q629	0	12.8	0
Q630	0	0	0
Q631	0	13.3	4.3
Q632	5.0	13.3	4.6
Q633	13.3	10.2	13.4
Q634	10.2	13.4	9.8
Q638	0	6.7	0

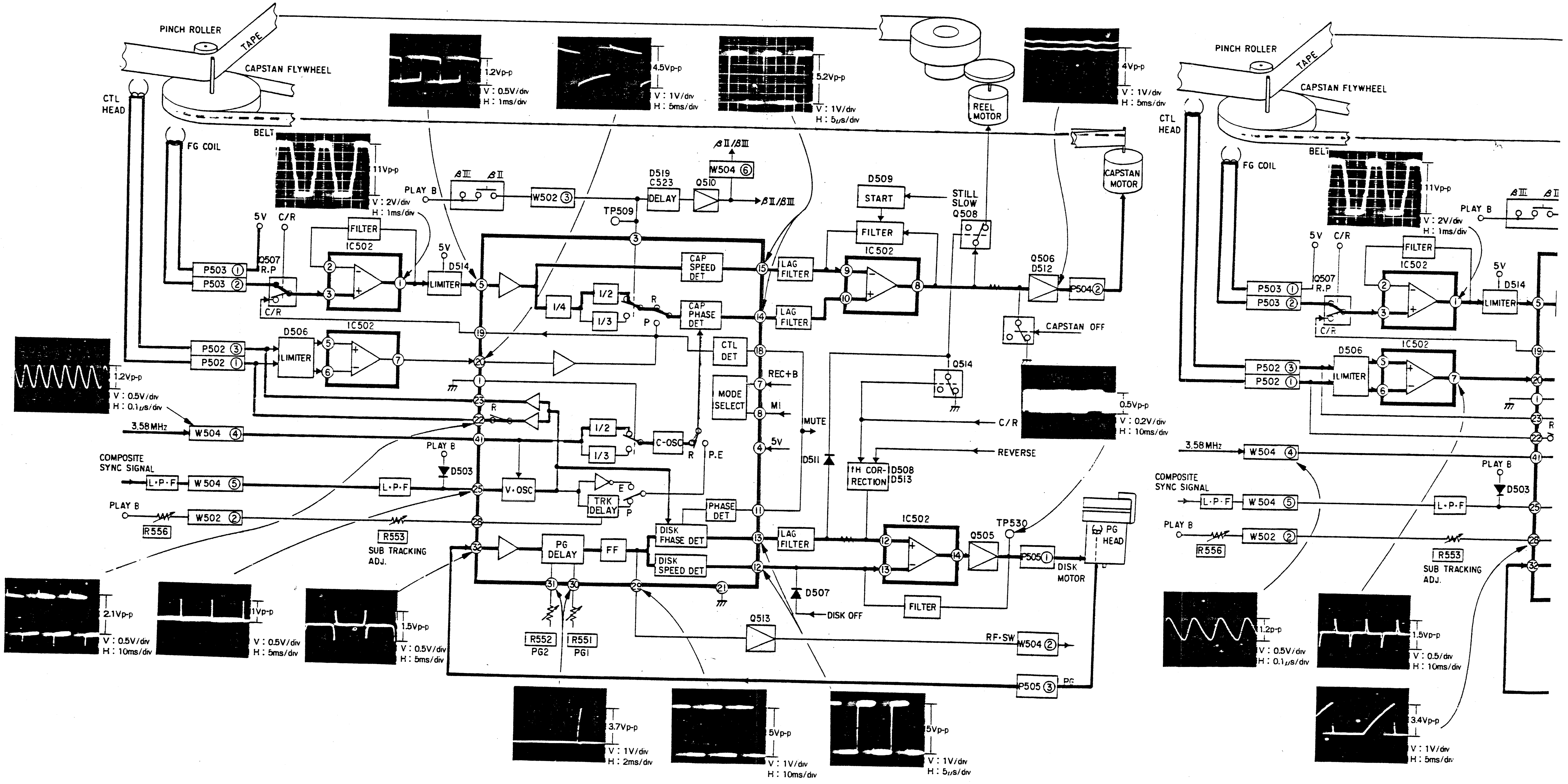
18. Logic Circuit


U502 LOGIC CIRCUIT
S615 CAM SWITCH
P603
WHT CAM SWITCH A
YEL CAM SWITCH B
GRN CAM SWITCH C
RED COMMON(GND)
S641 LOADING END SWITCH
P605
S643 UNLOADING END SWITCH
Z601 4.7K x 8
IC601 TMP43206358Y MAIN LOGIC
VDD
CAM SW C
CAM SW B
CAM SW A
C.IN SW
C.DOWN SW
C.OUT SW
UL.END SW
L.END SW
CUE/REVIEW (M2)
TRICK
DATA
SLOW/STILL
CAPSTAN OFF
X OUT
X IN
RESET
INT
TEST
TAPE END
CAMERA IN
CAMERA PAUSE
SERVO LOCK
F L MOTOR A(S)
F L MOTOR B(L)
F L MOTOR C
F L CAM MOTOR ON
REEL MOTOR LOW
REEL MOTOR FWD
REEL MOTOR REW
REVERSE
PLAYBACK
AUDIO DUB
SERVO REC
REC MUTE (M1)
DISK OFF
VIDEO MUTE
AUDIO MUTE
GND
※ BUILT-IN PULL UP RESISTOR
C601 47μ (10V)
Q634 2SC2236-Y DRIVE
Q633 2SA1048Y SWITCH
Q632 RN1204 SWITCH
IC602 TA7351P OSC DET
BIAS
AMP
DET
IC604 TA7267P DRIVE
IC603 TA7267P DRIVE
IC605 TA7267P DRIVE
NC IN1 IN2 OUT1 GND OUT2 DRIVE Vcc NC NC
Q614 2SA1048-Y SWITCH
Q619 2SC2458-Y SWITCH
Q622 2SA1048-Y AMP
Q620 2SA966-Y SWITCH
Q611 2SA966-Y SWITCH
Q612 2SA1048-Y SWITCH
Q613 2SA966-Y SWITCH
Q635 RN1204 SWITCH
Q625 2SB435-Y DRIVE
Q626 2SC2458-Y DRIVE
Q624 2SC2458-Y SWITCH
Q621 2SC2458-Y SWITCH
Q627, Q629 2SC2458-Y
Q628, Q630 2SA966-Y
Q629 DRIVE
Q628 DRIVE
Q627 SWITCH
Q630 DRIVE
Q615 2SA562 SWITCH
Q616 2SC2458-Y SWITCH
Q617 2SC2458-Y SWITCH
Q618 2SC2458-Y SWITCH
Q623 2SC2458-Y SWITCH
D601 1SS155
D602 1SS156
D603 1SS176
D607 05Z3.6Z
D608 1SS176
D614 1SS176
W602
TO U102 PIF SELECTOR VIDEO, AUDIO CIRCUITS P202
WHT PLAY +6.5V
GRY REC +6.5V
BLU TRICK
GRN AUDIO MUTE
BRN VIDEO MUTE
W604
TO UX02 TIMER SELECTOR CIRCUIT W604
REC INH
RESET
W601
TO UX02 TIMER SELECTOR CIRCUIT W601 A-B
POWER ON
DATA
GND
CLOCK
TV/VCR
P602
BIAS GRY
FWD SENSOR WHT
P601
BIAS GRY
REW SENSOR WHT
W603
P607
LOADING M+ WHT
MOTOR GND
LOADING M- RED
P609
CAM MOTOR+ RED
MOTOR GND
CAM MOTOR- WHT
P608
REEL MOTOR- WHT
MOTOR GND
REEL MOTOR+ RED
P606
DEW HEATER BLU
REW PLAY/FF PLAY
PLAY+B
SERBO LOCK
SLOW+STILL
CAPSTAN OFF
DISK OFF
ON/OFF +5V
REC+B
REVERSE
REEL ERROR
PLAY+B
TO U502 SERBO CIRCUIT
+12V
MOTOR GND
+6.5V
HEATER
POWER OFF
IC +5V
HEATER ON
HEATER CONTROL
MOTOR +13.2V
ANT SW
TO U502 POWER CIRCUIT
5Vp-p
V: 2V div
H: 0.5ms div
4.6Vp-p
V: 1V div
H: 1μs div
Voltage Recording Mode
Voltage Playback Mode


6
7
8
9
10
11
12
13
14
15
16
U502 LOGIC CIRCUIT
IC602 TA7351P OSC DET
BIAS
AMP
DET
IC604 TA7267P DRIVE
IC603 TA7267P DRIVE
IC605 TA7267P DRIVE
Q634 2SC2236-Y DRIVE
Q633 2SA1048Y SWITCH
Q632 RN1204 SWITCH
Q627, Q629 2SC2458-Y
Q628, Q630 2SA966-Y
Q629 DRIVE
Q628 DRIVE
Q630 DRIVE
Q627 SWITCH
Q622 2SA1048-Y AMP
Q620 2SA966-Y SWITCH
Q611 2SA966-Y SWITCH
Q612 2SA1048-Y SWITCH
Q613 2SA966-Y SWITCH
Q636 RN1204
Q625 2SB435-Y DRIVE
Q626 2SC2458-Y DRIVE
Q624 2SC2458-Y SWITCH
Q62 2SC2458-Y SWITCH
Q623 2SC2458-Y SWITCH
D601 1SS155
D614 1SS176
D602 1SS156
D603 1SS176
W603
P602
P601
P620
P607
P609
P608
P606
L662 FWD SENSOR
L661 REW SENSOR
U620 F.L MOTOR
M005 F.L
M006 LOADING MOTOR
M003 CAM MOTOR
M004 REEL MOTOR
W123
RL92 DEW HEATER
1.6Vp-p
V: 1V/div
H: 5μs/div
TO U502 SERBO CIRCUIT
TO U502 POWER CIRCUIT
Remote Control Transmission Circuit
ICR01 μPC1474HA
Bias
Amplifier
ABLC
Limiter level shift
Peak detection
Output wave form shaping circuit
WR01
GND
REMOTE
E+5V
DR01 PH302
CR03 10μ 16V
RR01 2.2K
CR01 33μ 16V
RR02 22Ω
CR04 2200P
TR01
CR02 10μ 16V
RR03 5.6K
CR06 2200P
TR02
CR05 0.068μ
RR04 22K
CR07 47μ 10V
U602 LOGIC SWITCH CIRCUIT
WL01
TO UX02 TIMER, LOGIC SELECTOR CIRCUIT
PAUSE SL07
EJECT SL03
STOP SL02
REW SL04
FF SL06
PLAY SL05
5Vp-p
V: 2V/div
H: 500ms/div
TP-L01
TP-L02
WL02
ICL08 TA75393S
DL07 TLUG163
RL21 200
RL22 200
DL08 TLUG163
RX08 270Ω
DX16 TLUR163
QX05 RN1202
RL15 10K
RL14 270K
CL05 0.01μ
PL03
TO UR01 RECEIVER CIRCUIT
TPG05
TPX06
SX13 POWER ON
UH02 REEL ROTATION DET. CIRCUIT
RH91 270
HH91 THS102-A
PL04
40mVp-p
V: 20mV/div
H: 500ms/div

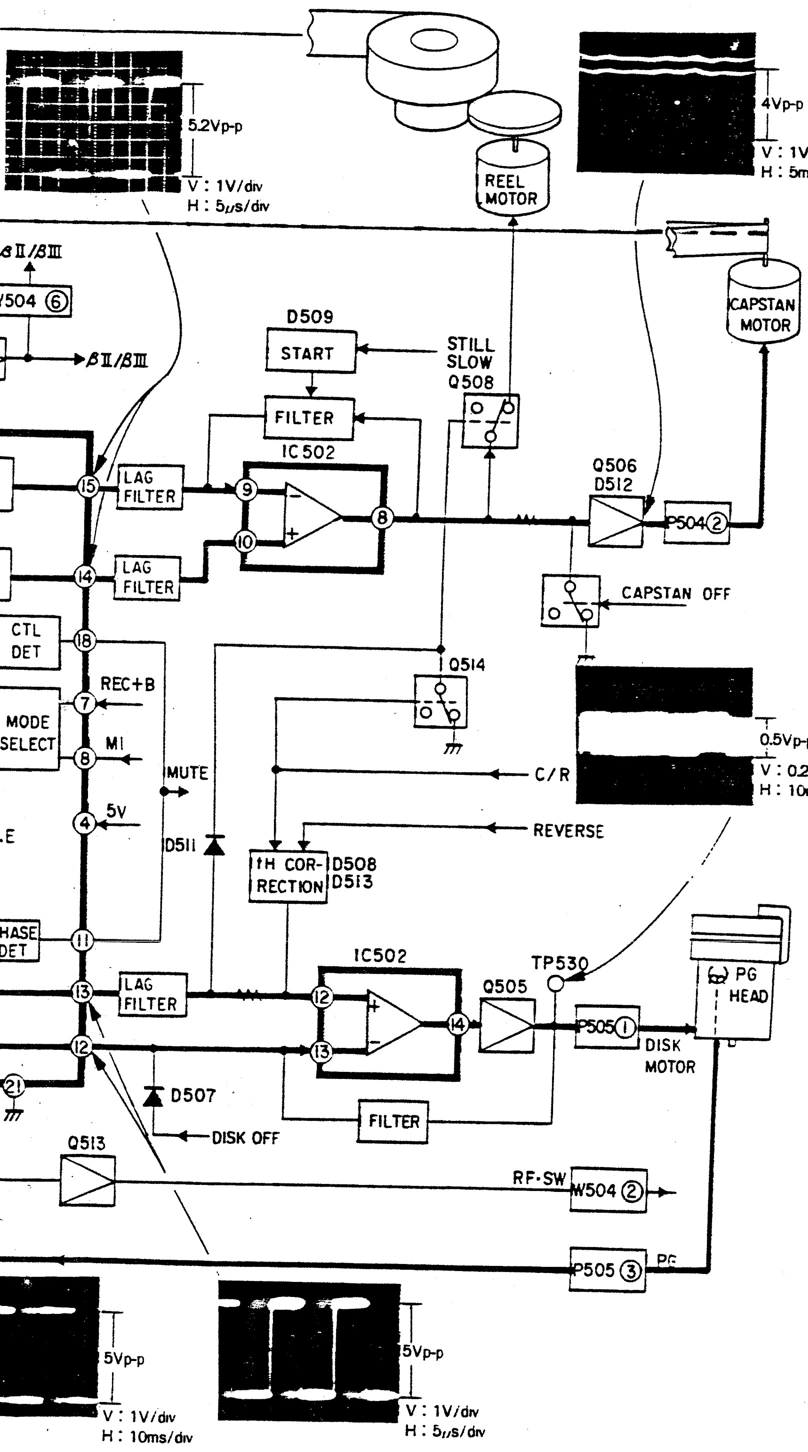
19. Servo Block Diagram

(Record mode)

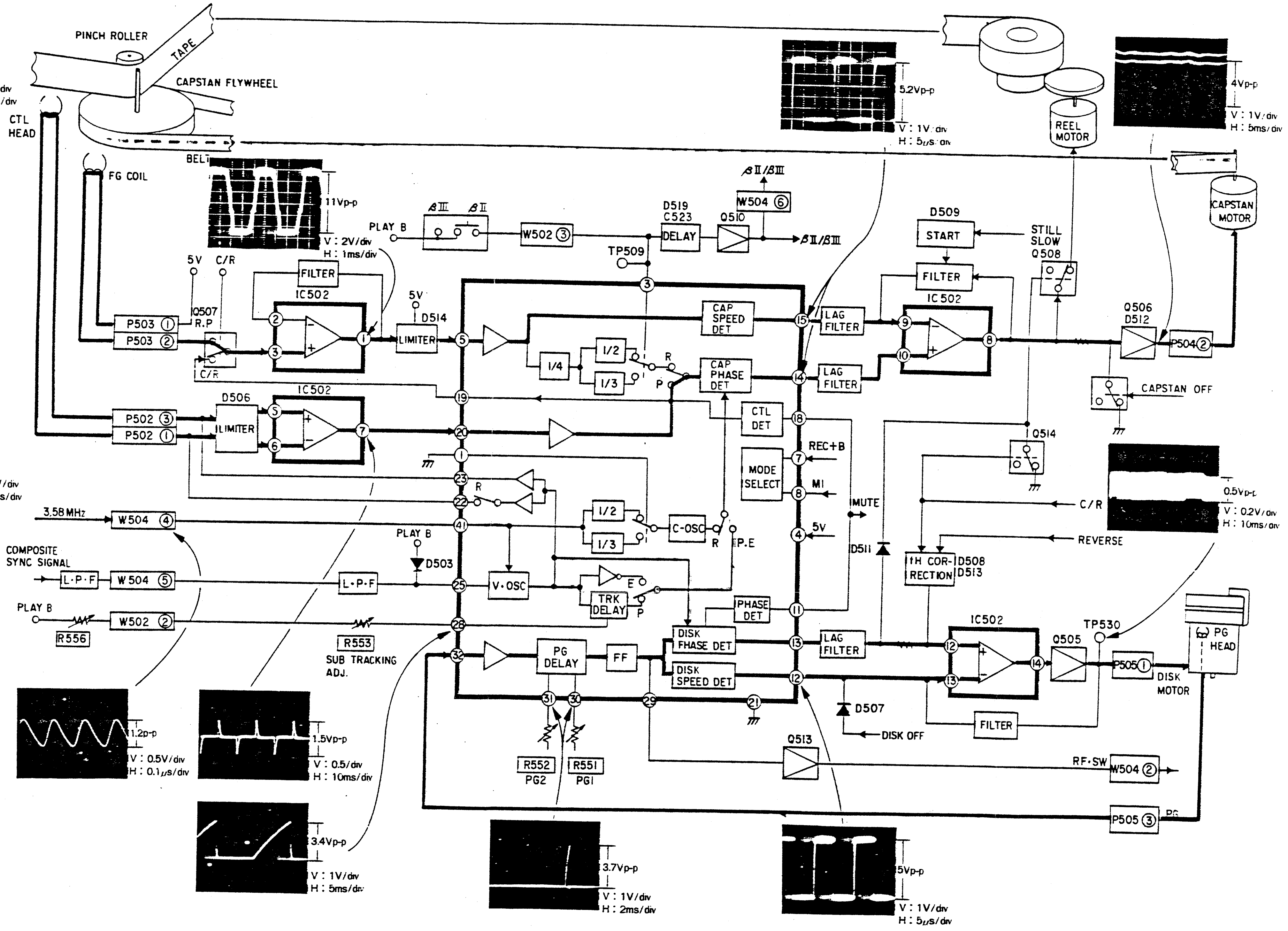


PINCH ROLLER
TAPE
CAPSTAN FLYWHEEL
CTL HEAD
BELT
FG COIL
REEL MOTOR
CAPSTAN MOTOR
11Vp-p
V : 2V/div
H : 1ms/div
1.2Vp-p
V : 0.5V/div
H : 1ms/div
4.5Vp-p
V : 1V/div
H : 5ms/div
5.2Vp-p
V : 1V/div
H : 5μs/div
4Vp-p
V : 1V/div
H : 5ms/div
βII/βIII
W504 ⑥
βIII
βII
PLAY B
W502 ③
D519
C523
DELAY
Q510
βII/βIII
TP509
D509
START
STILL
SLOW
Q508
FILTER
IC502
5V
C/R
P503 ①
P503 ②
Q507
R.P
C/R
D514
LIMITER
CAP SPEED DET
CAP PHASE DET
1/4
1/2
1/3
R
P
LAG FILTER
Q506
D512
P504②
CAPSTAN OFF
D506
P502 ③
P502 ①
CTL DET
MODE SELECT
REC+B
MI
MUTE
5V
Q514
C/R
REVERSE
0.5Vp-p
V : 0.2V/div
H : 10ms/div
1.2Vp-p
V : 0.5V/div
H : 0.1μs/div
3.58MHz
W504 ④
COMPOSITE SYNC SIGNAL
L·P·F
W504 ⑤
PLAY B
D503
V·OSC
C-OSC
E
TRK DELAY
P.E
D511
1H COR-RECTION
D508
D513
PHASE DET
W502 ②
R556
R553
SUB TRACKING ADJ.
PG DELAY
FF
DISK PHASE DET
DISK SPEED DET
LAG FILTER
Q505
TP530
PG HEAD
P505①
DISK MOTOR
D507
DISK OFF
Q513
RF·SW
W504 ②
R552
PG2
R551
PG1
P505 ③
PG
2.1Vp-p
V : 0.5V/div
H : 10ms/div
1Vp-p
V : 0.5V/div
H : 5ms/div
1.5Vp-p
V : 0.5V/div
H : 5ms/div
3.7Vp-p
V : 1V/div
H : 2ms/div
5Vp-p
V : 1V/div
H : 10ms/div
5Vp-p
V : 1V/div
H : 5μs/div
1.2p-p
V : 0.5V/div
H : 0.1μs/div
1.5Vp-p
V : 0.5/div
H : 10ms/div
3.4Vp-p
V : 1V/div
H : 5ms/div

(Play mode)

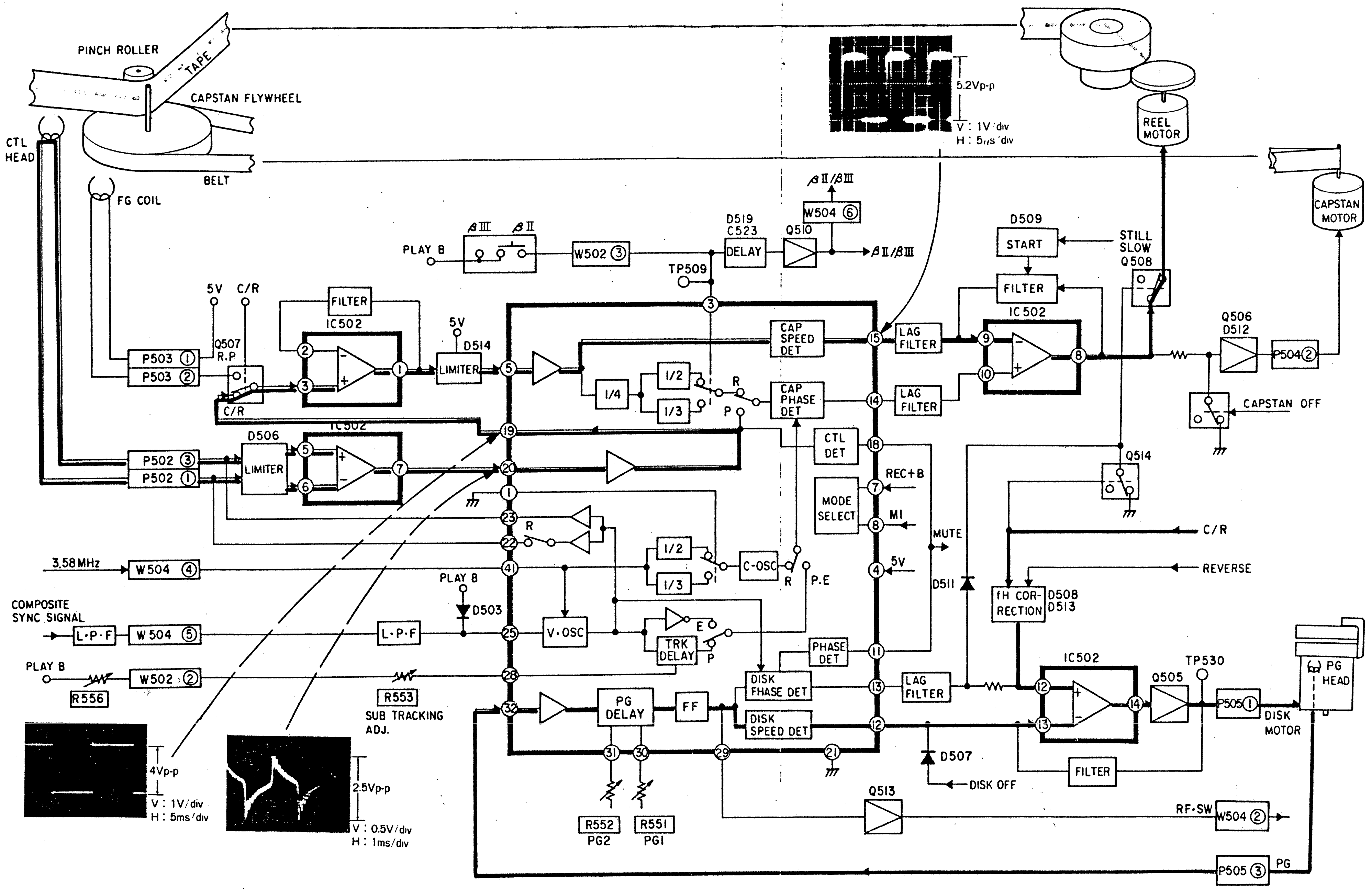


5.2Vp-p
V : 1V/div
H : 5μs/div
REEL MOTOR
4Vp-p
V : 1V/div
H : 5ms/div
βII/βIII
W504 ⑥
βII/βIII
D509
START
FILTER
STILL
SLOW
Q508
IC502
LAG FILTER
LAG FILTER
CTL DET
MODE SELECT
REC+B
MI
5V
MUTE
D511
tH COR-RECTION
D508
D513
C/R
REVERSE
Q514
Q506
D512
P504②
CAPSTAN MOTOR
CAPSTAN OFF
0.5Vp-p
V : 0.2V/div
H : 10ms/div
PHASE DET
LAG FILTER
IC502
Q505
TP530
P505①
DISK MOTOR
PG HEAD
D507
DISK OFF
FILTER
Q513
RF-SW
W504②
P505③
PG
5Vp-p
V : 1V/div
H : 10ms/div
5Vp-p
V : 1V/div
H : 5μs/div

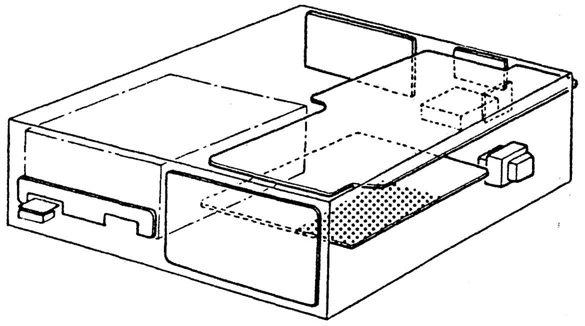


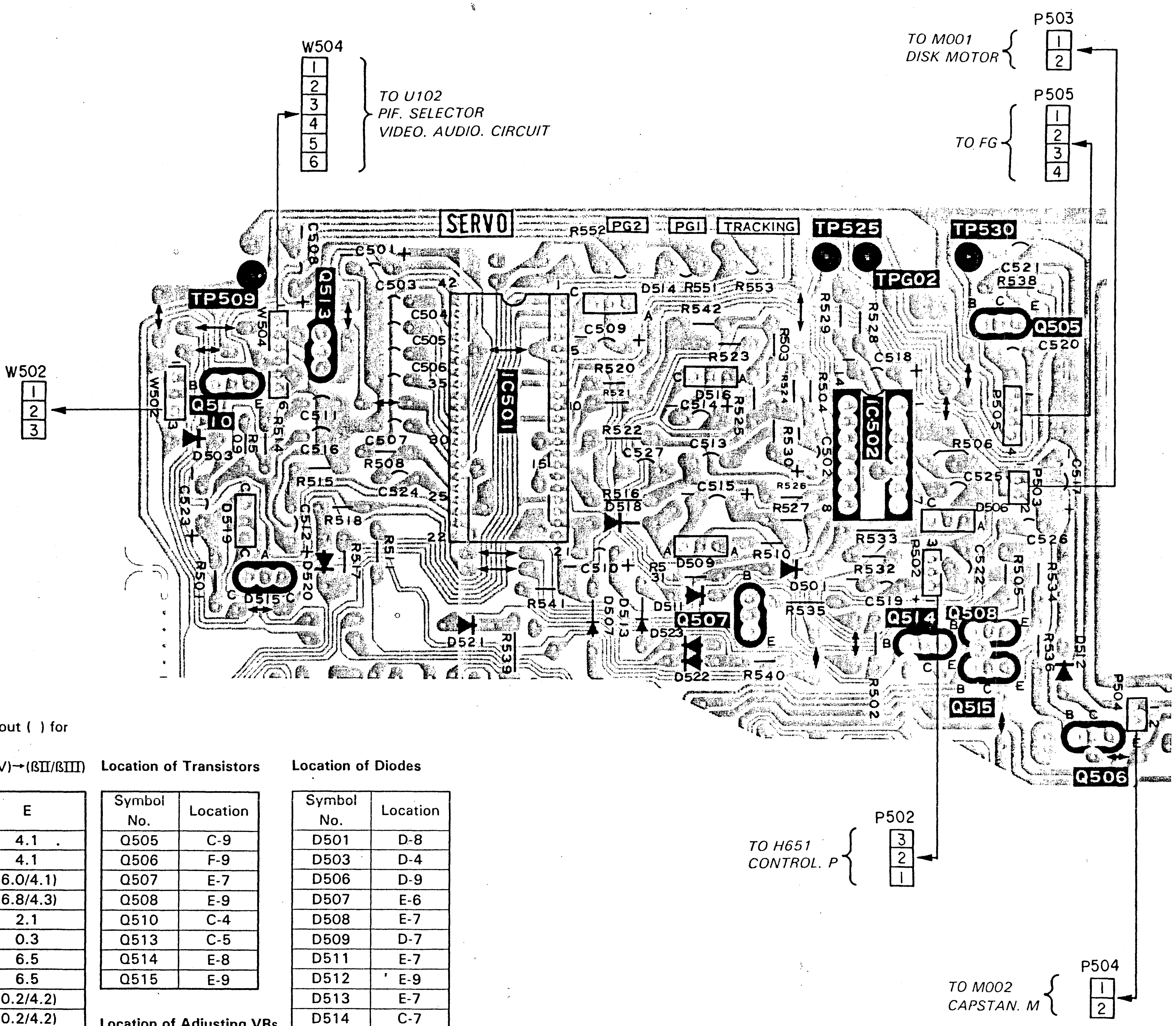
PINCH ROLLER
TAPE
CAPSTAN FLYWHEEL
CTL HEAD
BELT
FG COIL
11Vp-p
V : 2V/div
H : 1ms/div
5V
C/R
P503 ①
P503 ②
Q507
R.P
C/R
FILTER
IC502
5V
D514
LIMITER
PLAY B
βIII
βII
W502 ③
D519
C523
DELAY
Q510
βII/βIII
W504 ⑥
TP509
CAP SPEED DET
1/4
1/2
1/3
R
P
CAP PHASE DET
P502 ③
P502 ①
D506
LIMITER
IC502
CTL DET
MODE SELECT
REC+B
MI
5V
MUTE
D511
R
1/2
1/3
C-OSC
R
P.E
3.58MHz
W504 ④
COMPOSITE SYNC SIGNAL
L·P·F
W504 ⑤
L·P·F
PLAY B
D503
V·OSC
E
TRK DELAY
P
PHASE DET
PLAY B
R556
W502 ②
R553
SUB TRACKING ADJ.
PG DELAY
FF
DISK PHASE DET
DISK SPEED DET
R552
PG2
R551
PG1
1.2p-p
V : 0.5V/div
H : 0.1μs/div
1.5Vp-p
V : 0.5/div
H : 10ms/div
3.4Vp-p
V : 1V/div
H : 5ms/div
3.7Vp-p
V : 1V/div
H : 2ms/div
5.2Vp-p
V : 1V/div
H : 5μs/div
REEL MOTOR
4Vp-p
V : 1V/div
H : 5ms/div
CAPSTAN MOTOR
D509
START
STILL
SLOW
Q508
FILTER
IC502
LAG FILTER
LAG FILTER
Q506
D512
P504②
CAPSTAN OFF
Q514
0.5Vp-p
V : 0.2V/div
H : 10ms/div
C/R
REVERSE
tH COR-RECTION
D508
D513
LAG FILTER
IC502
Q505
TP530
P505①
DISK MOTOR
PG HEAD
D507
DISK OFF
FILTER
Q513
RF-SW
W504②
P505③
PG
5Vp-p
V : 1V/div
H : 5μs/div

(Cue/Review)


PINCH ROLLER
TAPE
CAPSTAN FLYWHEEL
CTL HEAD
BELT
FG COIL
5.2Vp-p
V : 1V/div
H : 5μs/div
REEL MOTOR
CAPSTAN MOTOR
PLAY B
βIII
βII
W502 ③
D519
C523
DELAY
Q510
W504 ⑥
βII/βIII
TP509
D509
START
STILL
SLOW
Q508
FILTER
IC502
5V
C/R
P503 ①
P503 ②
Q507
R.P
D514
LIMITER
CAP SPEED DET
1/2
1/4
1/3
R
P
CAP PHASE DET
LAG FILTER
Q506
D512
P504②
CAPSTAN OFF
D506
P502 ③
P502 ①
CTL DET
MODE SELECT
REC+B
MI
MUTE
Q514
C/R
REVERSE
3.58MHz
W504 ④
C-OSC
P.E
D511
fH COR-RECTION
D508
D513
COMPOSITE SYNC SIGNAL
L·P·F
W504 ⑤
D503
V·OSC
E
TRK DELAY
PHASE DET
IC502
Q505
TP530
PG HEAD
PLAY B
R556
W502 ②
R553
SUB TRACKING ADJ.
DISK FHASE DET
DISK SPEED DET
PG DELAY
FF
P505①
DISK MOTOR
D507
DISK OFF
FILTER
4Vp-p
V : 1V/div
H : 5ms/div
2.5Vp-p
V : 0.5V/div
H : 1ms/div
R552
PG2
R551
PG1
Q513
RF·SW
W504 ②
P505 ③
PG

20. Servo PC Board




1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
W504
1
2
3
4
5
6
TO U102
PIF. SELECTOR
VIDEO. AUDIO. CIRCUIT
P503
TO M001
DISK MOTOR
1
2
P505
TO FG
1
2
3
4
W502
TO UX02
TIMER LOGIC SELECTOR
CIRCUIT
1
2
3
SERVO
R552
PG2
PG1
TRACKING
TP525
TP530
TPG02
TP509
IC501
IC502
Q505
Q506
Q507
Q508
Q510
Q513
Q514
Q515
C501
C503
C504
C505
C506
C507
C508
C509
C510
C511
C513
C514
C515
C516
C518
C519
C520
C521
C522
C523
C524
C525
C526
C527
D501
D503
D506
D507
D509
D511
D512
D513
D514
D515
D516
D518
D519
D520
D521
D522
D523
R502
R503
R504
R505
R506
R508
R509
R510
R514
R515
R516
R517
R518
R520
R521
R522
R523
R524
R525
R526
R527
R528
R529
R530
R531
R532
R533
R534
R535
R536
R538
R539
R540
R541
R542
R551
R553
P502
P503
P504
P505
TO H651
CONTROL. P
3
2
1
P504
TO M002
CAPSTAN. M
1
2

Voltage

Upper line : REC values without ( ) for
both ßII/ßIII
Lower line : PLAY (0.0V/0.0V)→(ßII/ßIII)

Symbol No.	B	C	E
Q505	5.4	13.8	4.1
			4.1
Q506	(6.6/4.8)	13.8	(6.0/4.1)
	(6.8/4.9)	13.4	(6.8/4.3)
Q507			2.1
			0.3
Q508		5.3	6.5
	6.5	5.1	6.5
Q510	(0.9/4.9)	5.0	(0.2/4.2)
	(0.9/4.9)	5.0	(0.2/4.2)
Q513		2.5	5.0
		2.5	5.0
Q514		3.0	0
		6.5	0
Q515		5.1	0

Location of Transistors

Symbol No.	Location
Q505	C-9
Q506	F-9
Q507	E-7
Q508	E-9
Q510	C-4
Q513	C-5
Q514	E-8
Q515	E-9

Location of Adjusting VRs

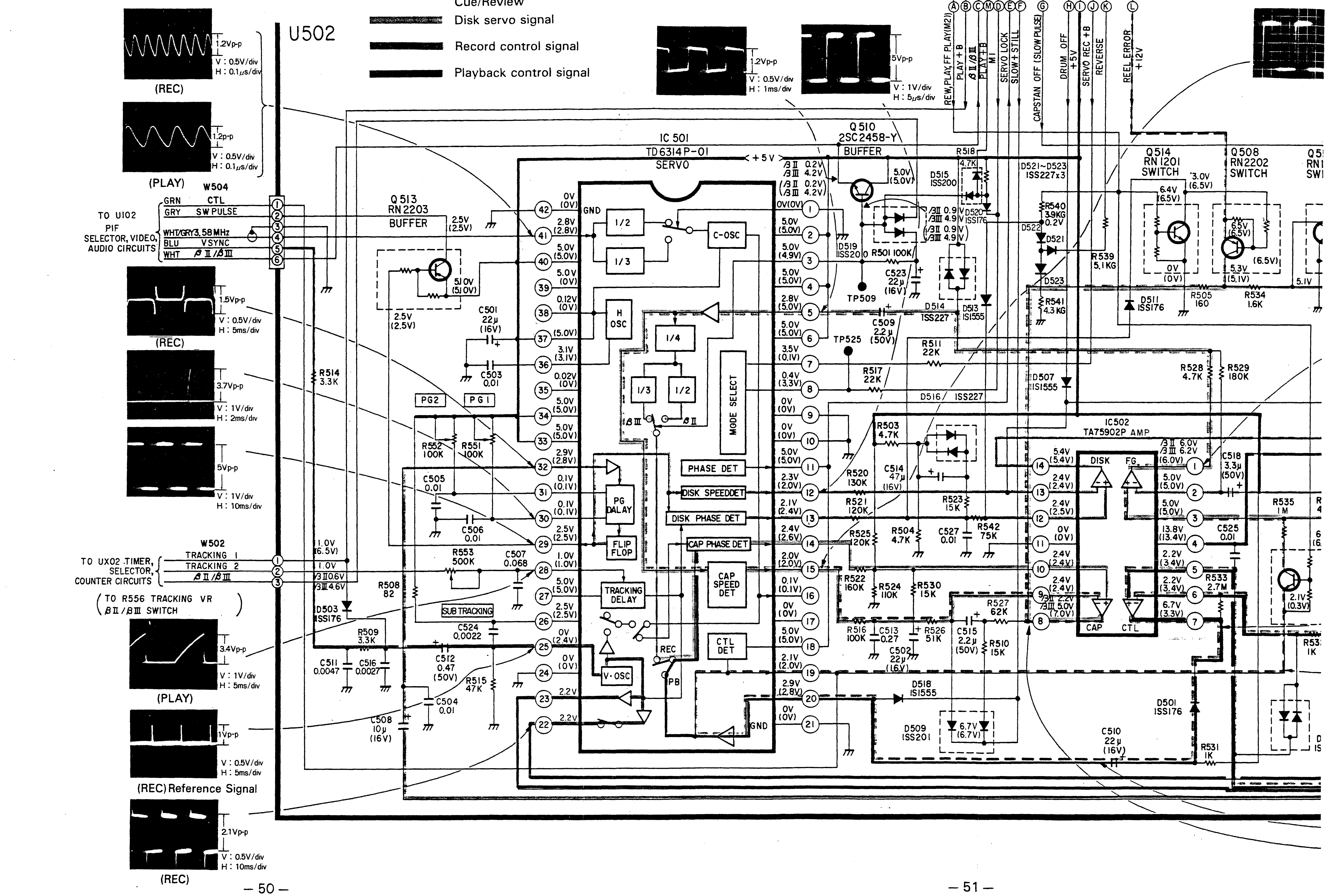
Symbol No.	Location
R551	C-7
R552	C-7
R553	C-7

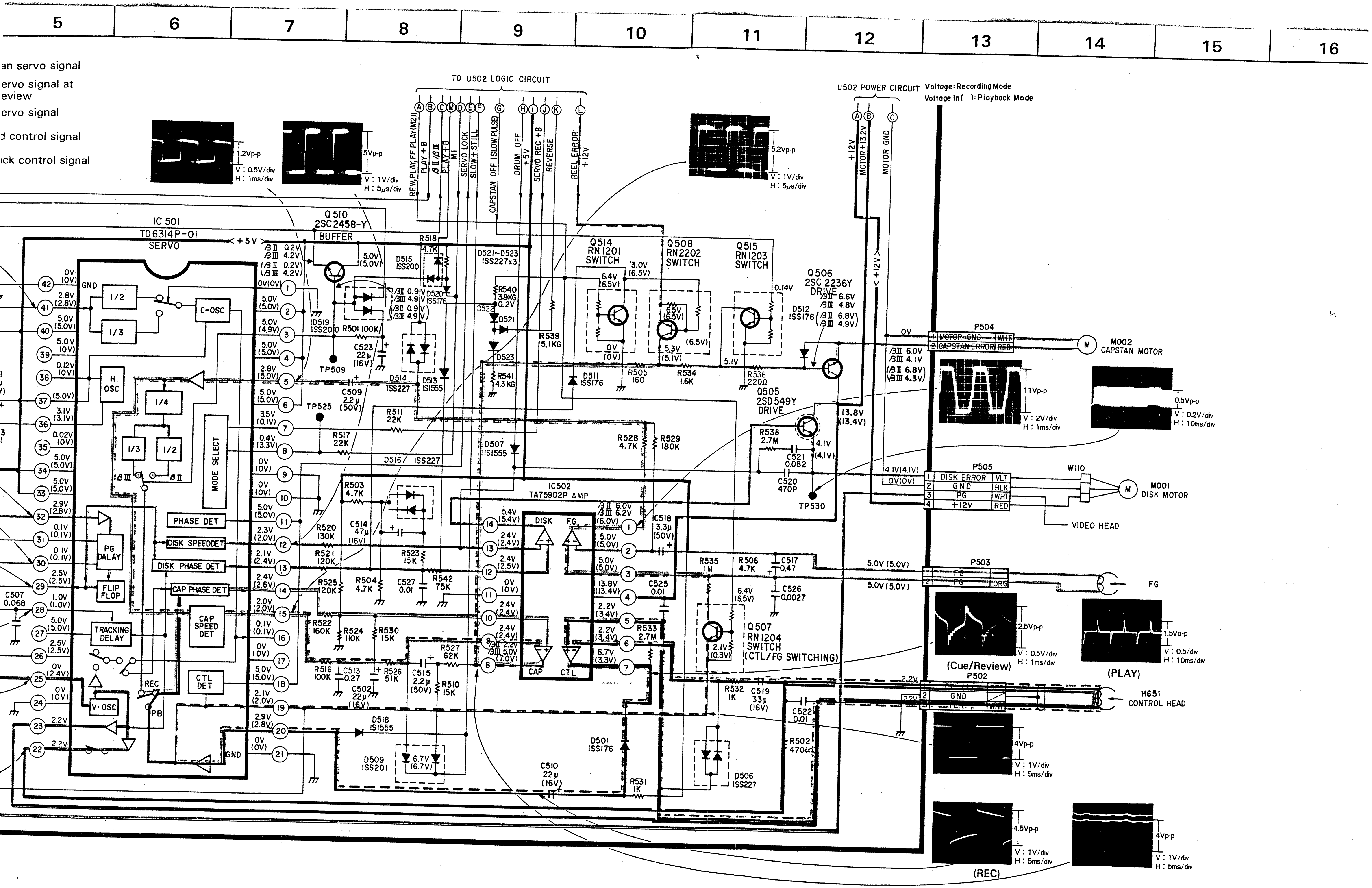
Location of Diodes

Symbol No.	Location
D501	D-8
D503	D-4
D506	D-9
D507	E-6
D508	E-7
D509	D-7
D511	E-7
D512	E-9
D513	E-7
D514	C-7
D515	E-4
D516	C-7
D518	D-7
D519	D-4
D520	D-5
D521	E-6
D522	E-7
D523	E-7

21. Servo Circuit

▬ Capstan servo signal
▪▪▪ Reel servo signal at Cue/Review
▨ Disk servo signal
▬ Record control signal
▬ Playback control signal

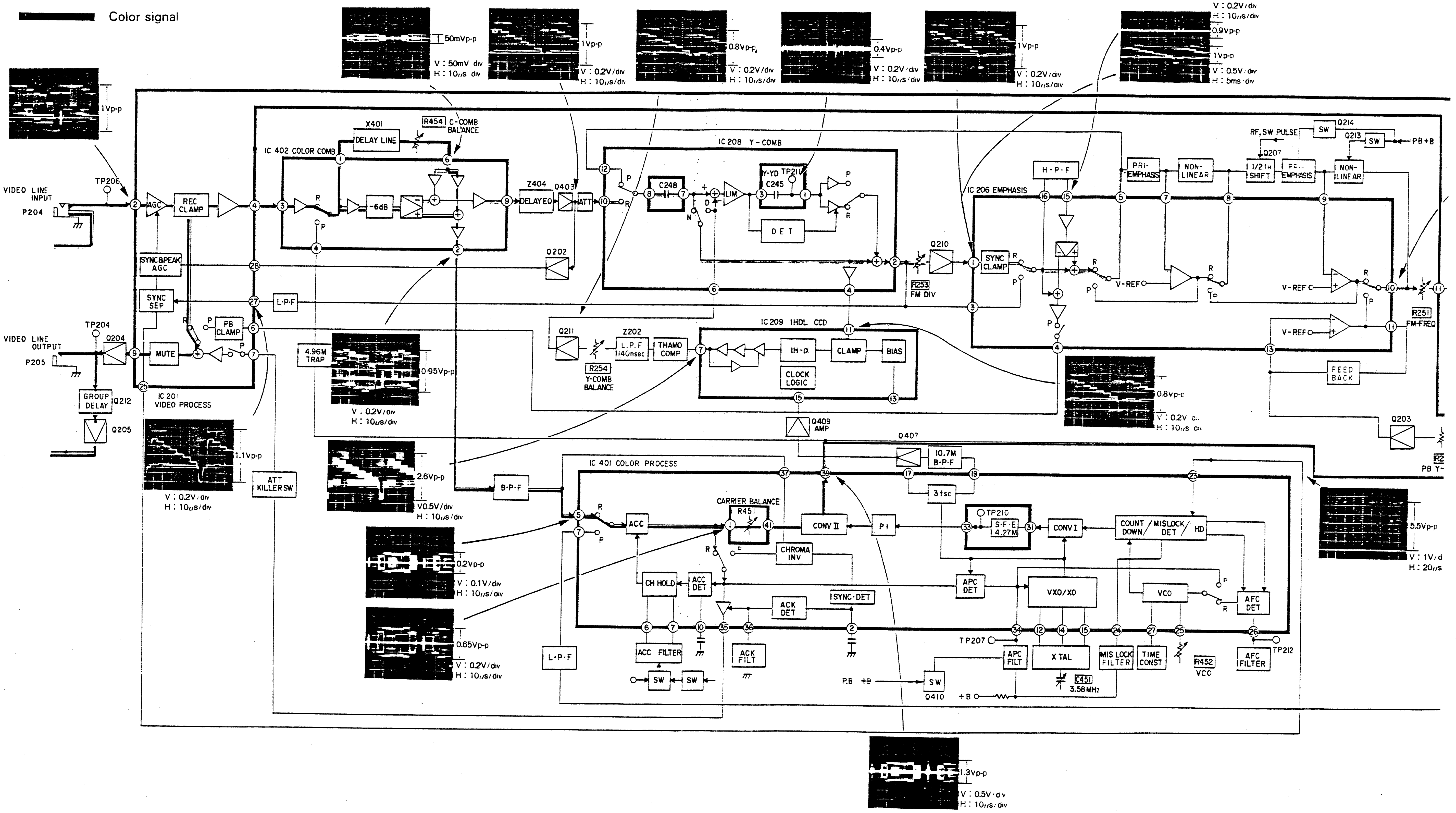

A
B
C
D
E
F
G
U502
1.2Vp-p V : 0.5V/div H : 0.1μs/div
(REC)
1.2p-p V : 0.5V/div H : 0.1μs/div
(PLAY)
W504
TO U102 PIF SELECTOR, VIDEO, AUDIO CIRCUITS
GRN CTL
GRY SW PULSE
WHT/GRY 3.58MHz
BLU VSYNC
WHT βII/βIII
1.5Vp-p V : 0.5V/div H : 5ms/div
(REC)
3.7Vp-p V : 1V/div H : 2ms/div
5Vp-p V : 1V/div H : 10ms/div
W502
TO UX02 TIMER, SELECTOR, COUNTER CIRCUITS
TRACKING 1
TRACKING 2
βII/βIII
(TO R556 TRACKING VR βII/βIII SWITCH)
3.4Vp-p V : 1V/div H : 5ms/div
(PLAY)
1Vp-p V : 0.5V/div H : 5ms/div
(REC) Reference Signal
2.1Vp-p V : 0.5V/div H : 10ms/div
(REC)
1.2Vp-p V : 0.5V/div H : 1ms/div
5Vp-p V : 1V/div H : 5μs/div
TO U502 LOGIC CIRCUIT
REW, PLAY, FF PLAY(M2)
PLAY+B
βII/βIII
PLAY+B
MI
SERVO LOCK
SLOW+STILL
CAPSTAN OFF (SLOW PULSE)
DRUM OFF
+5V
SERVO REC +B
REVERSE
REEL ERROR
+12V
Q513 RN2203 BUFFER
IC501 TD6314P-01 SERVO
Q510 2SC2458-Y BUFFER
Q514 RN1201 SWITCH
Q508 RN2202 SWITCH
IC502 TA75902P AMP
1/2
1/3
C-OSC
H OSC
1/4
MODE SELECT
PHASE DET
DISK SPEED DET
DISK PHASE DET
CAP PHASE DET
PG DALAY
FLIP FLOP
TRACKING DELAY
SUB TRACKING
CAP SPEED DET
CTL DET
V-OSC
REC
PB
GND
PG2
PG1
DISK
FG
CAP
CTL
TP509
TP525
R514 3.3K
R552 100K
R551 100K
R553 500K
R508 82
R509 3.3K
R515 47K
C501 22μ (16V)
C503 0.01
C505 0.01
C506 0.01
C507 0.068
C511 0.0047
C516 0.0027
C512 0.47 (50V)
C524 0.0022
C504 0.01
C508 10μ (16V)
D503 1SS176
D519 1SS200
R501 100K
C523 22μ (16V)
C509 2.2μ (50V)
R511 22K
R517 22K
D514 1SS227
D513 1S1555
D515 1SS200
D520 1SS176
R518 4.7K
D521~D523 1SS227x3
R540 3.9KΩ
R539 5.1KΩ
R541 4.3KΩ
D507 1S1555
D516 1SS227
D511 1SS176
R505 160
R534 1.6K
R528 4.7K
R529 180K
R503 4.7K
C514 47μ (16V)
R520 130K
R521 120K
R523 15K
R525 120K
R504 4.7K
C527 0.01
R542 75K
R522 160K
R524 110K
R530 15K
R527 62K
R516 100K
C513 0.27
R526 51K
C502 22μ (16V)
C515 2.2μ (50V)
R510 15K
D518 1S1555
D509 1SS201
C518 3.3μ (50V)
C525 0.01
R535 1M
R533 2.7M
R531 1K
C510 22μ (16V)
D501 1SS176
R53 1K


5
6
7
8
9
10
11
12
13
14
15
16
an servo signal
ervo signal at
eview
ervo signal
d control signal
ck control signal
TO U502 LOGIC CIRCUIT
REW,PLAY,FF PLAY(M2)
PLAY+B
βII/βIII
PLAY+B
M1
SERVO LOCK
SLOW+STILL
CAPSTAN OFF (SLOW PULSE)
DRUM OFF
+5V
SERVO REC +B
REVERSE
REEL ERROR
+12V
U502 POWER CIRCUIT
Voltage: Recording Mode
Voltage in ( ): Playback Mode
+12V
MOTOR+13.2V
MOTOR GND
1.2Vp-p
V: 0.5V/div
H: 1ms/div
5Vp-p
V: 1V/div
H: 5μs/div
5.2Vp-p
V: 1V/div
H: 5μs/div
IC 501
TD6314P-01
SERVO
+5V
1/2
1/3
C-OSC
H OSC
1/4
MODE SELECT
PHASE DET
DISK SPEED DET
DISK PHASE DET
CAP PHASE DET
PG DALAY
FLIP FLOP
TRACKING DELAY
CAP SPEED DET
CTL DET
V·OSC
REC
PB
GND
Q510
2SC2458-Y
BUFFER
Q514
RN1201
SWITCH
Q508
RN2202
SWITCH
Q515
RN1203
SWITCH
Q506
2SC2236Y
DRIVE
Q505
2SD549Y
DRIVE
Q507
RN1204
SWITCH
(CTL/FG SWITCHING)
IC502
TA75902P AMP
DISK
FG
CAP
CTL
TP509
TP525
TP530
P504
MOTOR GND
CAPSTAN ERROR
WHT
RED
M002
CAPSTAN MOTOR
11Vp-p
V: 2V/div
H: 1ms/div
0.5Vp-p
V: 0.2V/div
H: 10ms/div
P505
DISK ERROR
GND
PG
+12V
VLT
BLK
WHT
RED
W110
M001
DISK MOTOR
VIDEO HEAD
P503
FG
ORG
5.0V (5.0V)
2.5Vp-p
V: 0.5V/div
H: 1ms/div
(Cue/Review)
1.5Vp-p
V: 0.5/div
H: 10ms/div
(PLAY)
P502
GND
H651
CONTROL HEAD
4Vp-p
V: 1V/div
H: 5ms/div
4.5Vp-p
V: 1V/div
H: 5ms/div
(REC)
4Vp-p
V: 1V/div
H: 5ms/div
R518 4.7K
R501 100K
R540 39KΩ
R539 5.1KΩ
R541 4.3KΩ
R505 160
R534 1.6K
R536 220Ω
R538 2.7M
R528 4.7K
R529 180K
R511 22K
R517 22K
R503 4.7K
R520 130K
R521 120K
R523 15K
R525 120K
R504 4.7K
R542 75K
R522 160K
R524 110K
R530 15K
R516 100K
R526 51K
R527 62K
R510 15K
R535 1M
R506 4.7K
R533 2.7M
R532 1K
R531 1K
R502 470Ω
C523 22μ (16V)
C509 2.2μ (50V)
C514 47μ (16V)
C527 0.01
C513 0.27
C502 22μ (16V)
C515 2.2μ (50V)
C521 0.082
C520 470P
C518 3.3μ (50V)
C517 0.47
C525 0.01
C526 0.0027
C519 33μ (16V)
C522 0.01
C510 22μ (16V)
C507 0.068
D515 1SS200
D520 1SS176
D521~D523 1SS227×3
D519 1SS200
D514 1SS227
D513 1S1555
D511 1SS176
D512 1SS176
D507 1S1555
D516 1SS227
D518 1S1555
D509 1SS201
D501 1SS176
D506 1SS227

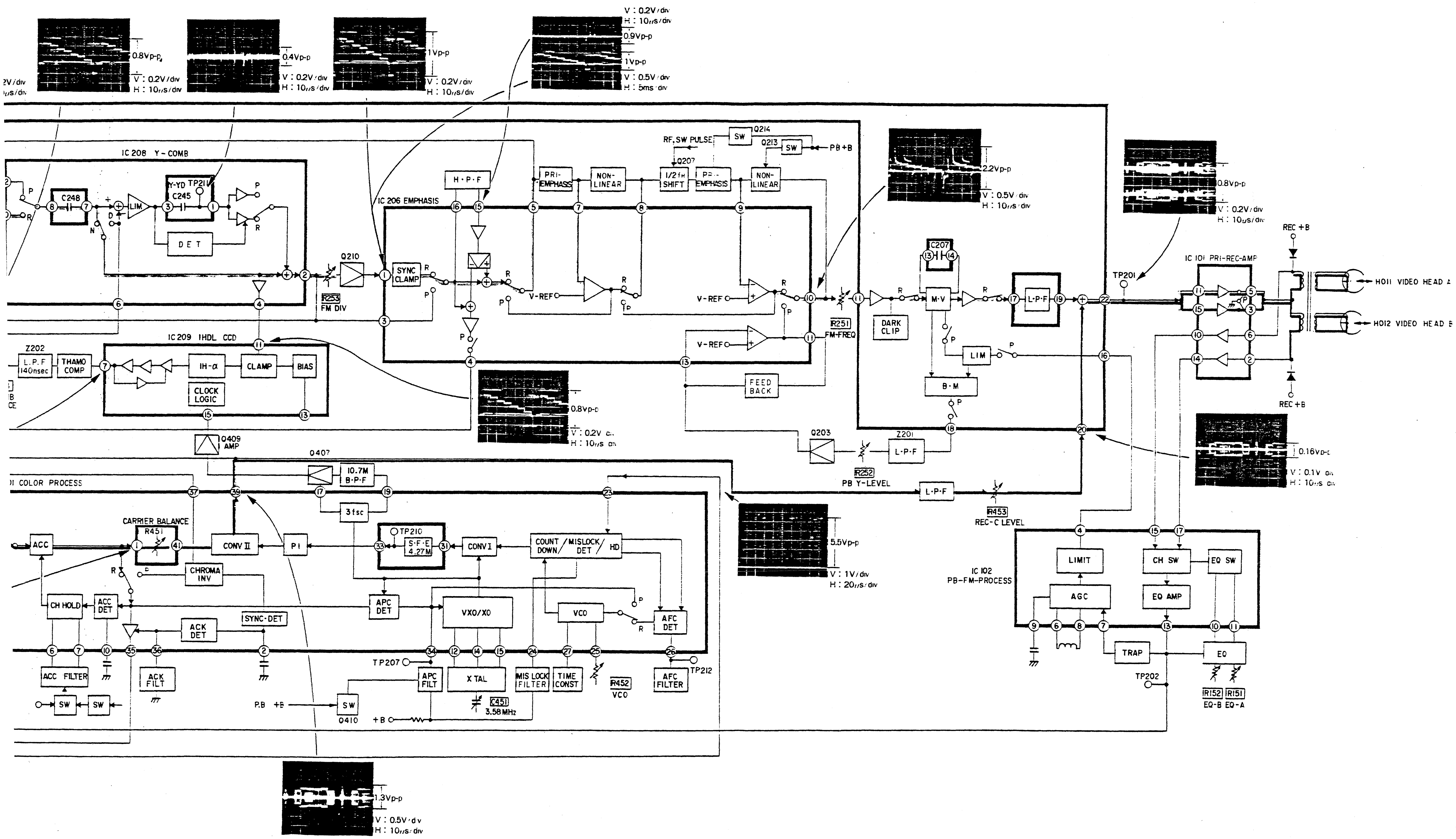
22. Video Block Diagram (Rec Mode)

▨ Y signal

■ Color signal



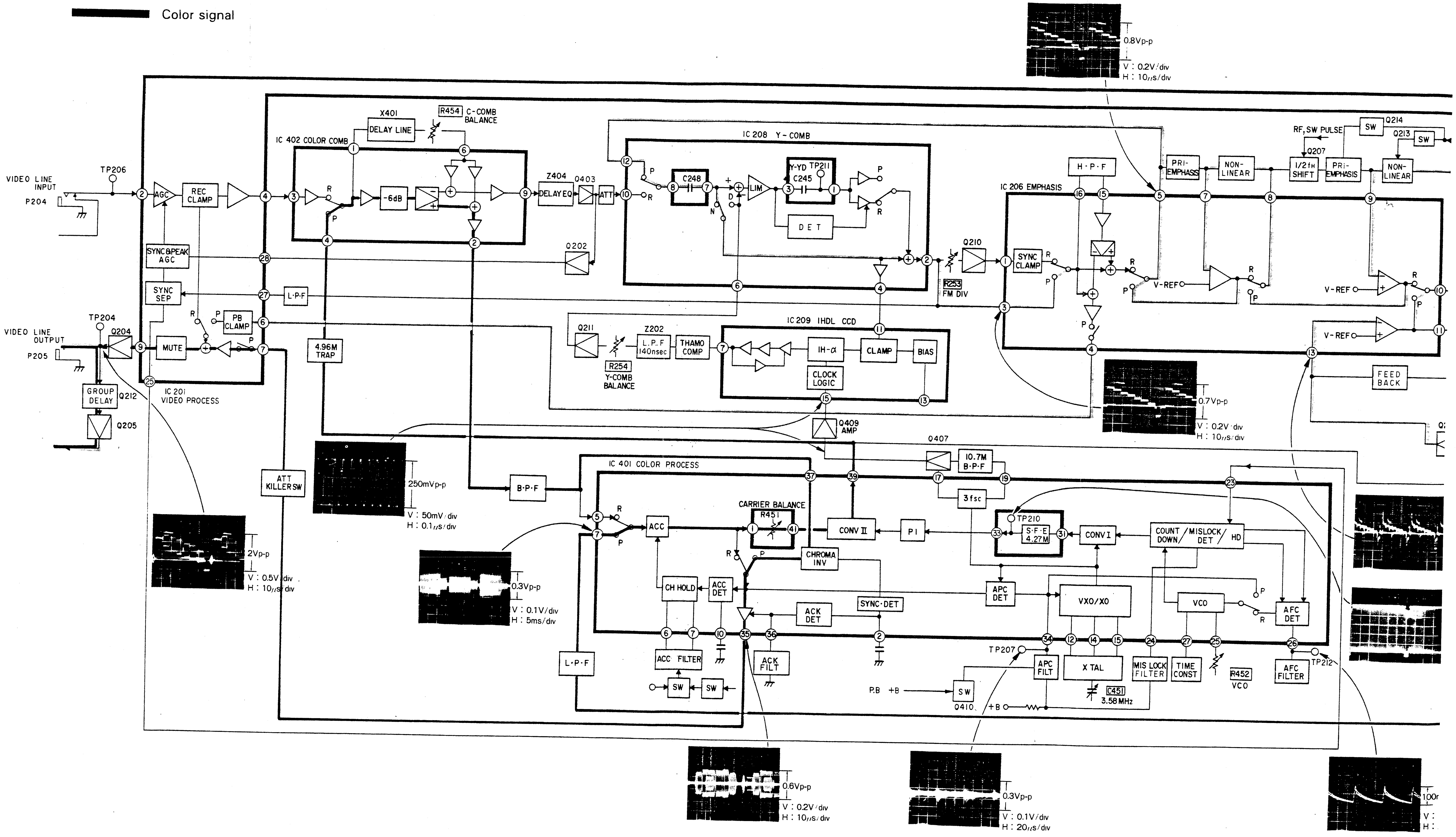
1Vp-p
VIDEO LINE INPUT
P204
TP206
AGC
REC CLAMP
SYNC&PEAK AGC
SYNC SEP
TP204
VIDEO LINE OUTPUT
P205
Q204
MUTE
PB CLAMP
GROUP DELAY
Q212
Q205
IC 201 VIDEO PROCESS
1.1Vp-p
V : 0.2V/div
H : 10μs/div
ATT KILLER SW
L·P·F
4.96M TRAP
0.95Vp-p
V : 0.2V/div
H : 10μs/div
50mVp-p
V : 50mV div
H : 10μs div
X401
DELAY LINE
R454 C-COMB BALANCE
IC 402 COLOR COMB
-6dB
2.6Vp-p
V0.5V/div
H : 10μs/div
B·P·F
Z404
Q403
DELAY EQ
ATT
Q202
1Vp-p
V : 0.2V/div
H : 10μs/div
IC 208 Y-COMB
C248
LIM
Y-YD TP211
C245
DET
0.8Vp-p
V : 0.2V/div
H : 10μs/div
0.4Vp-p
V : 0.2V/div
H : 10μs/div
Q210
R253 FM DIV
Q211
Z202
L.P.F 140nsec
THAMO COMP
R254 Y-COMB BALANCE
IC 209 1HDL CCD
IH-α
CLAMP
BIAS
CLOCK LOGIC
Q409 AMP
Q407
10.7M B-P-F
3fsc
1Vp-p
V : 0.2V/div
H : 10μs/div
H·P·F
IC 206 EMPHASIS
SYNC CLAMP
V-REF
0.8Vp-p
V : 0.2V div
H : 10μs div
V : 0.2V/div
H : 10μs/div
0.9Vp-p
1Vp-p
V : 0.5V/div
H : 5ms/div
RF, SW PULSE
SW
Q214
Q213
PB+B
Q207
PRI-EMPHASIS
NON-LINEAR
1/2fH SHIFT
PRI-EMPHASIS
NON-LINEAR
R251 FM-FREQ
FEED BACK
Q203
PB Y-
5.5Vp-p
V : 1V/d
H : 20μs
IC 401 COLOR PROCESS
CARRIER BALANCE R451
ACC
CONV II
PI
CHROMA INV
TP210
S·F·E 4.27M
CONV I
COUNT DOWN/ MISLOCK DET/ HD
CH HOLD
ACC DET
SYNC·DET
ACK DET
APC DET
VXO/XO
VCO
AFC DET
0.2Vp-p
V : 0.1V/div
H : 10μs/div
0.65Vp-p
V : 0.2V/div
H : 10μs/div
L·P·F
ACC FILTER
ACK FILT
SW
SW
TP207
APC FILT
X TAL
C451 3.58MHz
MIS LOCK FILTER
TIME CONST
R452 VCO
AFC FILTER
TP212
P.B +B
SW
Q410
+B
1.3Vp-p
V : 0.5V/div
H : 10μs/div


IC 208 Y-COMB
C248
LIM
Y-YD TP211
C245
DET
Q210
R253 FM DIV
IC 209 1HDL CCD
Z202
L.P.F 140nsec
THAMO COMP
1H-α
CLAMP
BIAS
CLOCK LOGIC
Q409 AMP
Q407
10.7M B.P.F
3fsc
IC 206 EMPHASIS
H.P.F
SYNC CLAMP
PRI-EMPHASIS
NON-LINEAR
RF.SW PULSE
Q214
SW
Q213
SW
PB+B
Q207
1/2fH SHIFT
PRI-EMPHASIS
NON-LINEAR
V-REF
FEED BACK
R251 FM-FREQ
DARK CLIP
C207
M.V
L.P.F
LIM
B.M
Q203
R252 PB Y-LEVEL
Z201 L.P.F
L.P.F
R453 REC-C LEVEL
TP201
IC 101 PRI-REC-AMP
REC +B
H011 VIDEO HEAD A
H012 VIDEO HEAD B
IC 102 PB-FM-PROCESS
LIMIT
AGC
CH SW
EQ SW
EQ AMP
TRAP
EQ
TP202
R152 R151 EQ-B EQ-A
COLOR PROCESS
CARRIER BALANCE R451
ACC
CONV II
P I
CHROMA INV
TP210
S.F.E 4.27M
CONV I
COUNT DOWN / MISLOCK DET / HD
APC DET
VXO/XO
VCO
AFC DET
CH HOLD
ACC DET
SYNC-DET
ACK DET
ACC FILTER
ACK FILT
SW
SW
TP207
APC FILT
X TAL
C451 3.58MHz
MIS LOCK FILTER
TIME CONST
R452 VCO
AFC FILTER
TP212
P.B +B
SW Q410
+B
0.8Vp-p V: 0.2V/div H: 10μs/div
0.4Vp-p V: 0.2V/div H: 10μs/div
1Vp-p V: 0.2V/div H: 10μs/div
V: 0.2V/div H: 10μs/div 0.9Vp-p 1Vp-p V: 0.5V/div H: 5ms/div
2.2Vp-p V: 0.5V/div H: 10μs/div
0.8Vp-p V: 0.2V/div H: 10μs/div
0.8Vp-p V: 0.2V div H: 10μs div
0.16Vp-p V: 0.1V div H: 10μs div
5.5Vp-p V: 1V/div H: 20μs/div
1.3Vp-p V: 0.5V/div H: 10μs/div

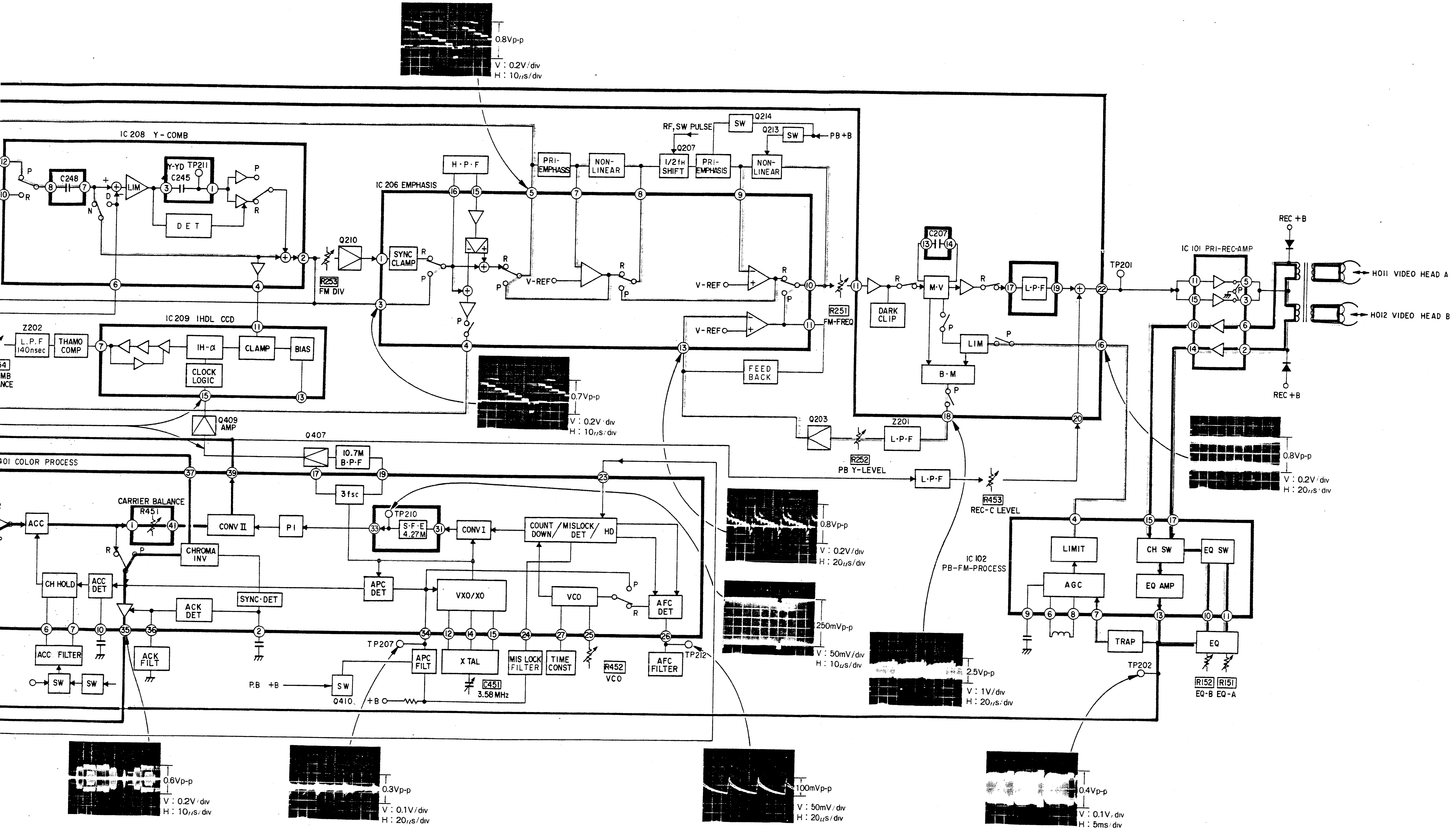
(Play Mode)

▬ Y signal

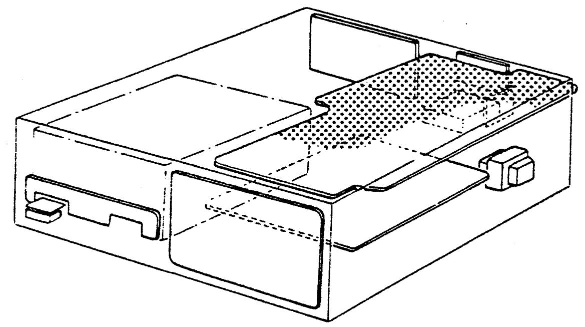
▬ Color signal

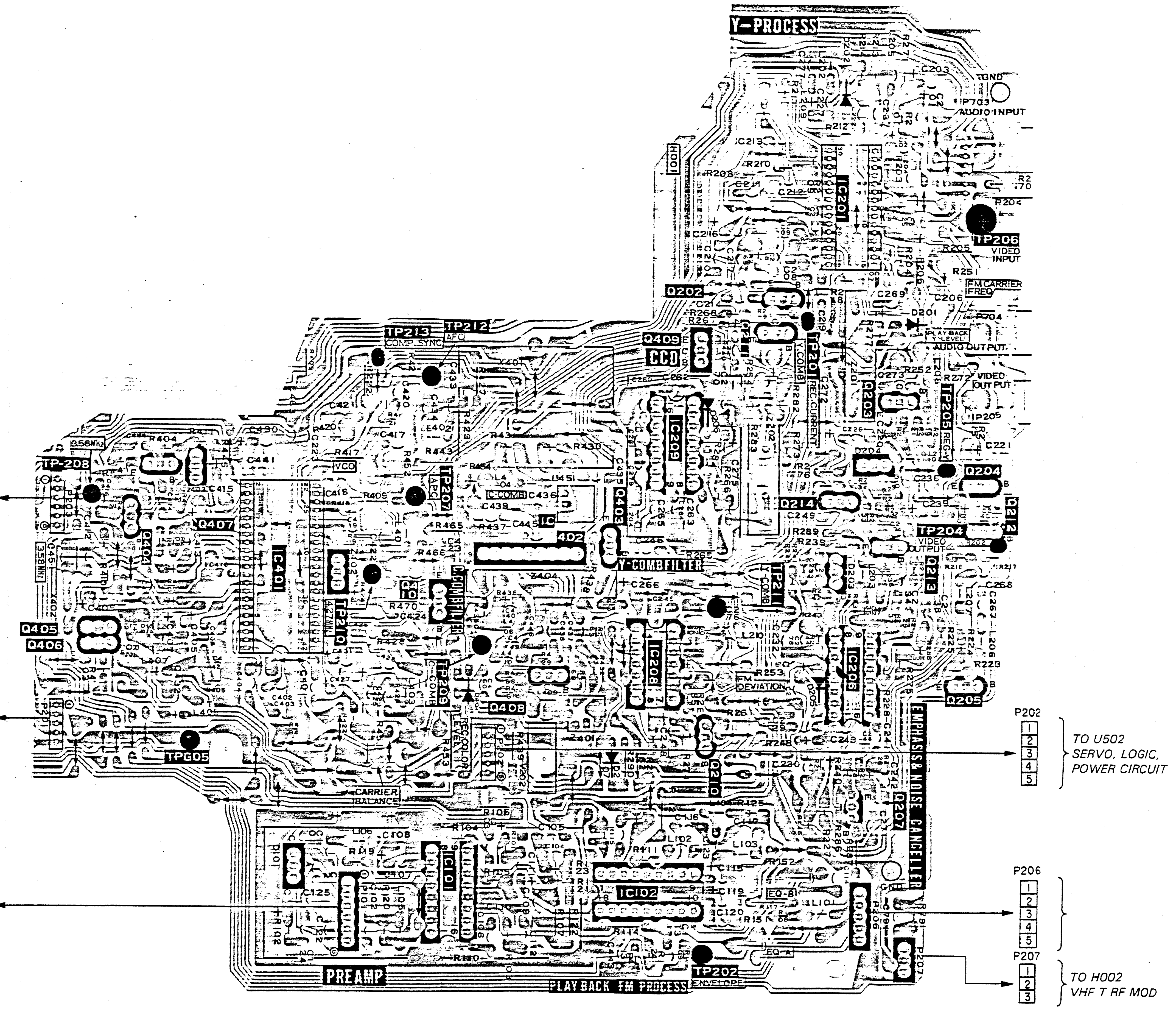


0.8Vp-p
V : 0.2V/div
H : 10μs/div
VIDEO LINE INPUT
P204
TP206
AGC
REC CLAMP
SYNC&PEAK AGC
SYNC SEP
PB CLAMP
MUTE
VIDEO LINE OUTPUT
P205
TP204
Q204
GROUP DELAY
Q212
Q205
IC 201 VIDEO PROCESS
L·P·F
4.96M TRAP
ATT KILLER SW
X401
DELAY LINE
R454 C-COMB BALANCE
IC 402 COLOR COMB
-6dB
Z404
DELAY EQ
Q403
ATT
Q202
IC 208 Y-COMB
C248
LIM
Y-YD TP211
C245
DET
Q210
R253 FM DIV
Q211
Z202
L.P.F 140nsec
THAMO COMP
R254 Y-COMB BALANCE
IC 209 IHDL CCD
IH-α
CLAMP
BIAS
CLOCK LOGIC
Q409 AMP
Q407
10.7M B·P·F
3fsc
IC 206 EMPHASIS
H·P·F
SYNC CLAMP
V-REF
PRI-EMPHASIS
NON-LINEAR
RF, SW PULSE
SW
Q214
Q213
Q207
1/2fH SHIFT
FEED BACK
0.7Vp-p
V : 0.2V/div
H : 10μs/div
250mVp-p
V : 50mV/div
H : 0.1μs/div
2Vp-p
V : 0.5V/div
H : 10μs/div
0.3Vp-p
V : 0.1V/div
H : 5ms/div
B·P·F
IC 401 COLOR PROCESS
ACC
CARRIER BALANCE
R451
CHROMA INV
CONV II
PI
TP210
S·F·E 4.27M
CONV I
COUNT DOWN/ MISLOCK/ DET/ HD
CH HOLD
ACC DET
ACK DET
SYNC·DET
APC DET
VXO/XO
VCO
AFC DET
ACC FILTER
ACK FILT
SW
P.B +B
Q410
+B
TP207
APC FILT
X TAL
C451 3.58MHz
MIS LOCK FILTER
TIME CONST
R452 VCO
AFC FILTER
TP212
0.6Vp-p
V : 0.2V/div
H : 10μs/div
0.3Vp-p
V : 0.1V/div
H : 20μs/div
100r
V :
H :


IC 208 Y-COMB
C248
LIM
Y-YD TP211
C245
DET
IC 209 IHDL CCD
IH-α
CLAMP
BIAS
CLOCK LOGIC
Z202
L.P.F 140nsec
THAMO COMP
Q210
R253 FM DIV
IC 206 EMPHASIS
H·P·F
SYNC CLAMP
V-REF
PRI-EMPHASIS
NON-LINEAR
1/2fH SHIFT
RF, SW PULSE
Q207
SW Q214
Q213
SW
PB+B
FEED BACK
R251 FM-FREQ
C207
DARK CLIP
M·V
L·P·F
LIM
B·M
TP201
Q203
Z201
R252 PB Y-LEVEL
R453 REC-C LEVEL
IC 101 PRI-REC-AMP
REC +B
H011 VIDEO HEAD A
H012 VIDEO HEAD B
IC 102 PB-FM-PROCESS
LIMIT
AGC
CH SW
EQ SW
EQ AMP
TRAP
EQ
TP202
R152 EQ-B
R151 EQ-A
Q409 AMP
Q407
10.7M B·P·F
3fsc
401 COLOR PROCESS
CARRIER BALANCE R451
ACC
CONV II
PI
TP210 S·F·E 4.27M
CONV I
COUNT DOWN / MISLOCK DET / HD
CHROMA INV
CH HOLD
ACC DET
ACK DET
SYNC·DET
APC DET
VXO/XO
VCO
AFC DET
ACC FILTER
SW
ACK FILT
P.B +B
Q410
TP207
APC FILT
X TAL
C451 3.58MHz
MIS LOCK FILTER
TIME CONST
R452 VCO
AFC FILTER
TP212
0.8Vp-p V: 0.2V/div H: 10μs/div
0.7Vp-p V: 0.2V/div H: 10μs/div
0.8Vp-p V: 0.2V/div H: 20μs/div
250mVp-p V: 50mV/div H: 10μs/div
2.5Vp-p V: 1V/div H: 20μs/div
0.8Vp-p V: 0.2V/div H: 20μs/div
0.6Vp-p V: 0.2V/div H: 10μs/div
0.3Vp-p V: 0.1V/div H: 20μs/div
100mVp-p V: 50mV/div H: 20μs/div
0.4Vp-p V: 0.1V/div H: 5ms/div

23. Video PC Board




1
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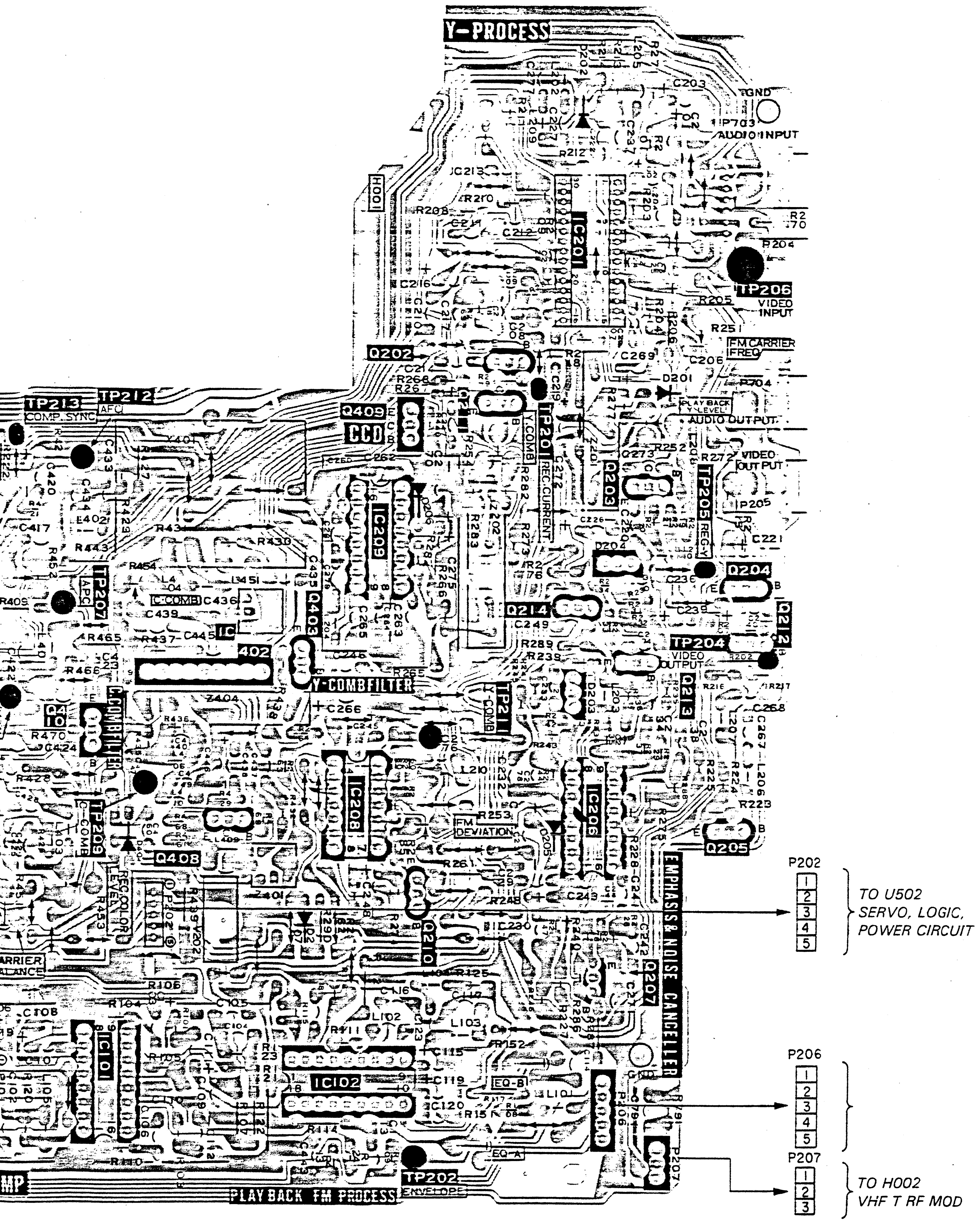
12
A
B
C
D
E
F
G
Y-PROCESS
GND
TP703
AUDIO INPUT
IC201
TP206
VIDEO INPUT
FM CARRIER FREQ
Q202
PLAYBACK Y-LEVEL
AUDIO OUTPUT
VIDEO OUTPUT
Q409
CCD
TP201
REC.CURRENT
Q203
TP205
REC.Y
TP213
COMP. SYNC
TP212
AFC
Q204
Q214
TP204
VIDEO OUTPUT
Q212
Q213
IC209
Q403
402
Y-COMB FILTER
TP211
Y-COMB
IC206
Q205
FM DEVIATION
IC208
TP208
P203
Q407
IC401
VCO
TP207
APC
TP210
C.CONVERTER
Q405
Q406
TP209
C-COMB
Q408
P201
TPG05
CARRIER BALANCE
Q210
Q207
EMPHASIS & NOISE CANCELLER
IC101
IC102
EQ-B
EQ-A
D101
PREAMP
TP202
ENVELOPE
PLAYBACK FM PROCESS
P101
P202
P206
P207
TO U502
SERVO, LOGIC,
POWER CIRCUIT
TO U502
SERVO, LOGIC
POWER CIRCUIT
TO H011
VIDEO HEAD A
TO H012
VIDEO HEAD B
TO U502
SERVO, LOGIC,
POWER CIRCUIT
TO H002
VHF T RF MOD

6 7 8 9 10 11 12 13 14 15 16


Y-PROCESS
TGND
TP703 AUDIO INPUT
TP206 VIDEO INPUT
FM CARRIER FREQ
PLAY BACK Y LEVEL
AUDIO OUTPUT
VIDEO OUT PUT
TP213 COMP. SYNC
TP212 AFC
CCD
Q409
Q202
IC201
IC209
IC208
IC206
IC101
IC102
TP201 Y.COMB
REC. CURRENT
TP205 REC-Y
Q203
Q204
Q205
Q212
Q213
Q214
Q210
Q207
Q403
Q408
TP204 VIDEO OUTPUT
TP207 APC
TP209
TP211
C-COMB
Y-COMBFILTER
C-COMBFILTER
FM DEVIATION
REC COLOR LEVEL
CARRIER BALANCE
EMPHASIS & NOISE CANCELLER
EQ-B
EQ-A
TP202 ENVELOPE
PLAYBACK FM PROCESS
P202
TO U502 SERVO, LOGIC, POWER CIRCUIT
P206
P207
TO H002 VHF T RF MOD

Location of ICs

Symbol No.	Location
IC101	G-6
IC102	G-8
IC201	B-9
IC206	E-9
IC208	E-8
IC209	D-8
IC401	E-5
IC402	D-7

Location of Diodes

Symbol No.	Location
D101	G-5
D201	C-10
D202	A-9
D203	E-9
D204	D-9
D205	E-9
D206	C-8
D207	F-7
D401	E-6

Location of adjusting VRs

Symbol No.	Location
R151	G-9
R152	G-9
R251	B-10
R252	C-9
R253	E-8
R254	C-8
R451	F-6
R452	D-6
R453	F-6
R454	D-6

Voltage of transistors

V : Rec mode
(V) : Play mode
$\overline{V}$: Tric mode

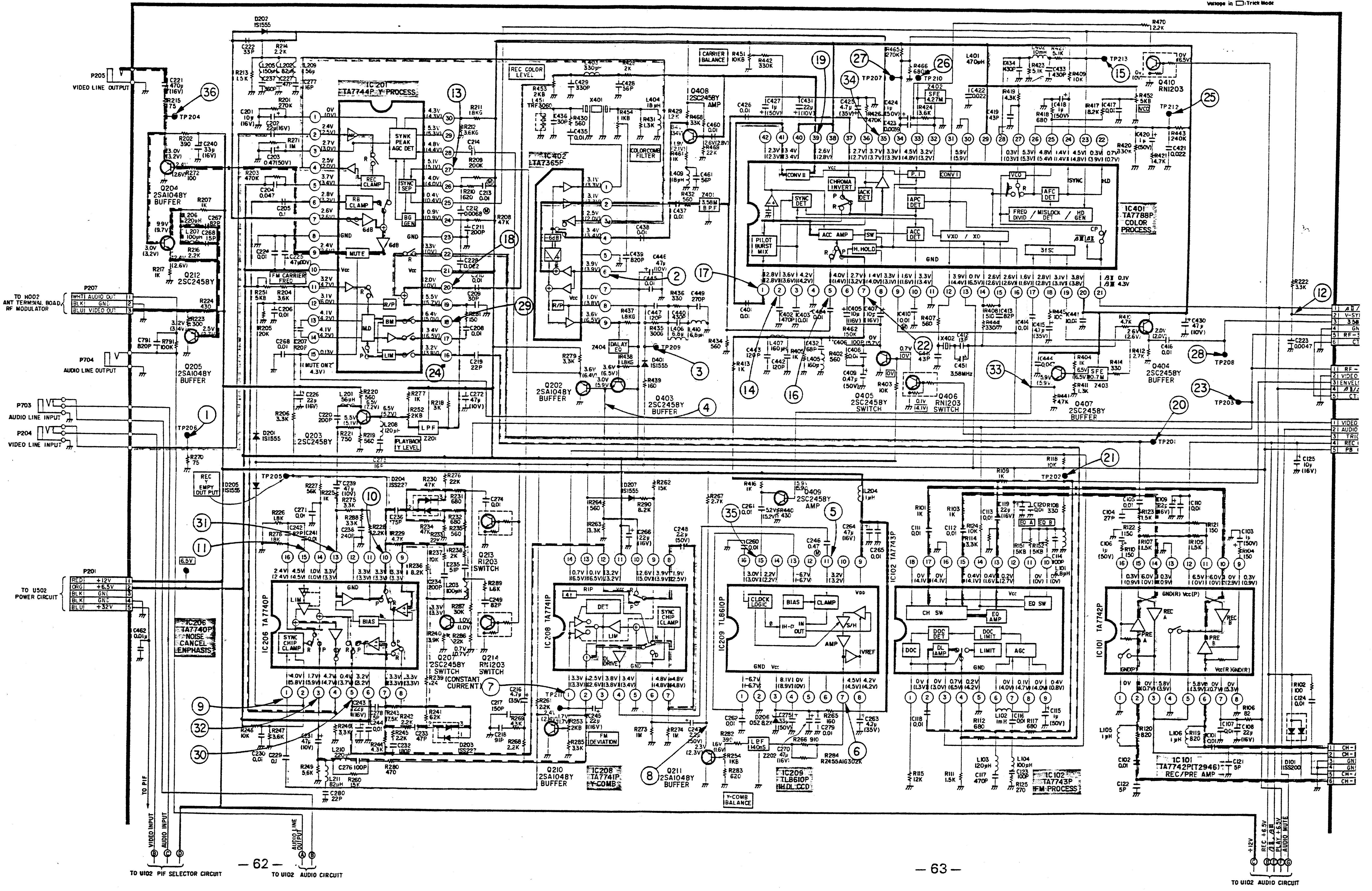
	B	C	E	Location
Q202	3.0 (5.9)	— —	3.6 (6.4)	C-9
Q203	6.5 5.7	6.5 (7.2)	5.5 (5.1)	C-9
Q204	2.4 (2.6)	— —	3.0 (3.2)	D-10
Q205	2.5 (2.7)	— —	3.2 (3.4)	E-10
Q207	1.0 (1.0)	3.3 (3.3)	0.7 (0.7)	F-9
Q210	1.7 (1.7)	— —	2.4 (2.4)	F-8
Q211	1.6 (1.6)	— —	2.3 (2.3)	C-9
Q212	3.0 (3.2)	9.7	2.4 (2.6)	D-10
Q213	0.1 (6.5)	3.3 (3.3)	— —	D-9
Q214	0.1 (6.5)	3.3 (6.5)	— —	D-9
Q403	3.6 (6.5)	6.5 (6.5)	3.0 (5.9)	D-7
Q404	2.6 (2.6)	6.5 (6.5)	2.0 (2.0)	D-4
Q405	0.7 $\overline{0}$	0 (5.7)	— $\overline{0}$	E-4
Q406		0.7 $\overline{0}$	0.1 4.1	E-4
Q407	6.5 (6.5)	6.5 (6.5)	5.9 (5.9)	D-4
Q408	2.6 (2.8)	3.4 (3.4)	1.9 (2.1)	E-7
Q409	5.9 (5.9)	— —	5.2 (5.2)	C-8
Q410	0 (6.5)	— —	0 0	E-6

24. Video Circuit

▬▬▬ Playback color signal
▪▪▪▪▪▪▪ Playback Y signal
▬▬▬ Record color signal
▪▪▪▪▪▪▪ Record Y signal

U102 VIDEO CIRCUIT

Voltage : Recording Mode
Voltage in ( ): Playback Mode
Voltage in ☐: Trick Mode


1
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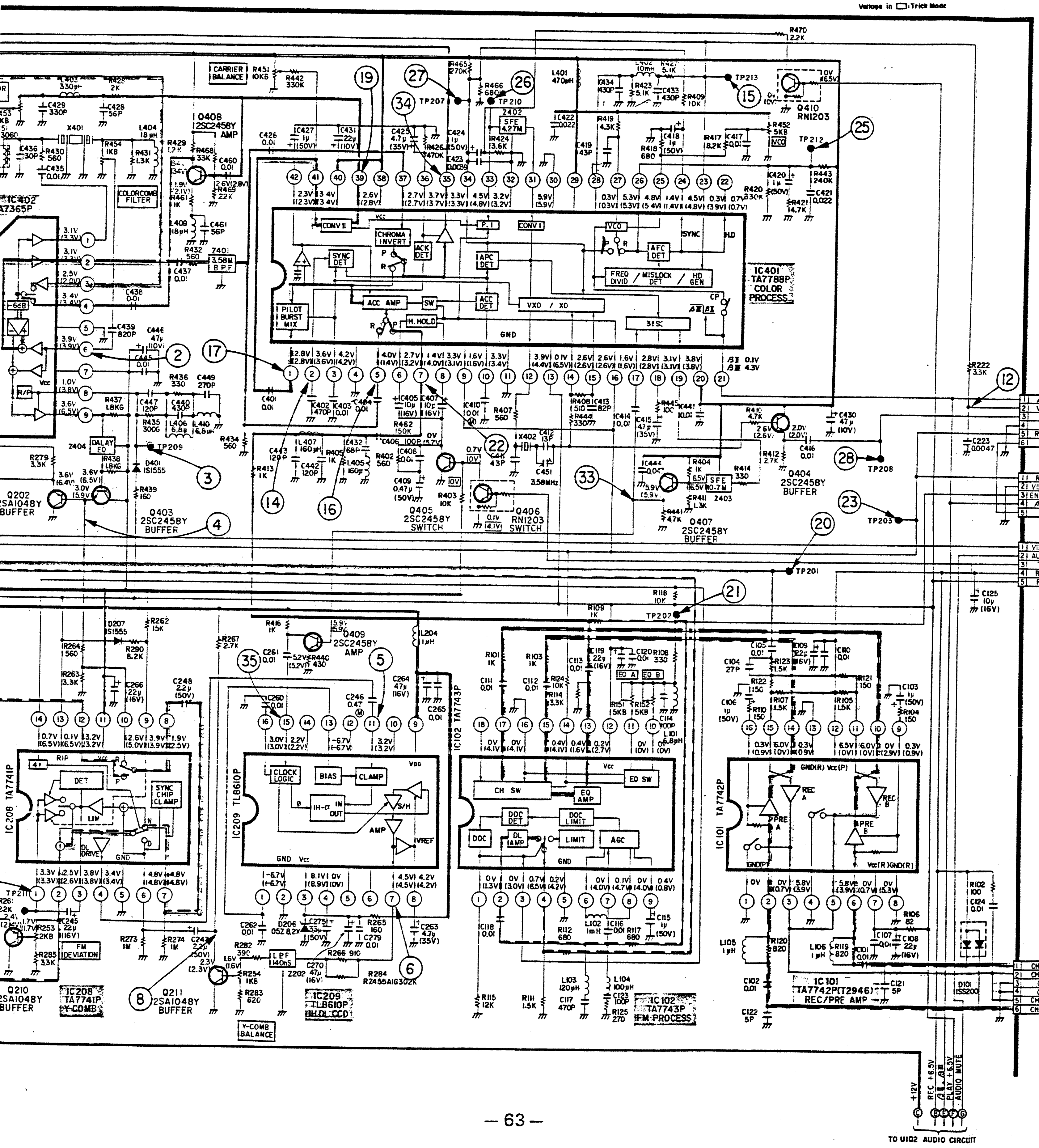
A
B
C
D
E
F
G
IC201 TA7744P Y PROCESS
IC402 TA7365P
IC401 TA7788P COLOR PROCESS
IC206 TA7740P NOISE CANCEL EMPHASIS
IC208 TA7741P Y-COMB
IC209 TLB610P 1H DL CCD
IC102 TA7743P FM PROCESS
IC101 TA7742P(T2946) REC/PRE AMP
Q204 2SA1048Y BUFFER
Q212 2SC2458Y
Q205 2SA1048Y BUFFER
Q202 2SA1048Y BUFFER
Q403 2SC2458Y BUFFER
Q408 2SC2458Y AMP
Q405 2SC2458Y SWITCH
Q406 RN1203 SWITCH
Q407 2SC2458Y BUFFER
Q404 2SC2458Y BUFFER
Q410 RN1203
Q203 2SC2458Y
Q207 2SC2458Y SWITCH (CONSTANT CURRENT)
Q213 RN1203 SWITCH
Q214 RN1203 SWITCH
Q210 2SA1048Y BUFFER
Q211 2SA1048Y BUFFER
Q409 2SC2458Y AMP
P205 VIDEO LINE OUTPUT
P207 TO H002 ANT TERMINAL BOARD RF MODULATOR
P704 AUDIO LINE OUTPUT
P703 AUDIO LINE INPUT
P204 VIDEO LINE INPUT
P201 TO U502 POWER CIRCUIT
REC COLOR LEVEL
CARRIER BALANCE
COLOR COMB FILTER
DELAY EQ
LPF
PLAYBACK Y LEVEL
REC EMPTY OUT PUT
FM DEVIATION
Y-COMB BALANCE
TO PIF
VIDEO INPUT
AUDIO INPUT
AUDIO LINE OUTPUT
TO U102 PIF SELECTOR CIRCUIT
TO U102 AUDIO CIRCUIT

ayback Y signal

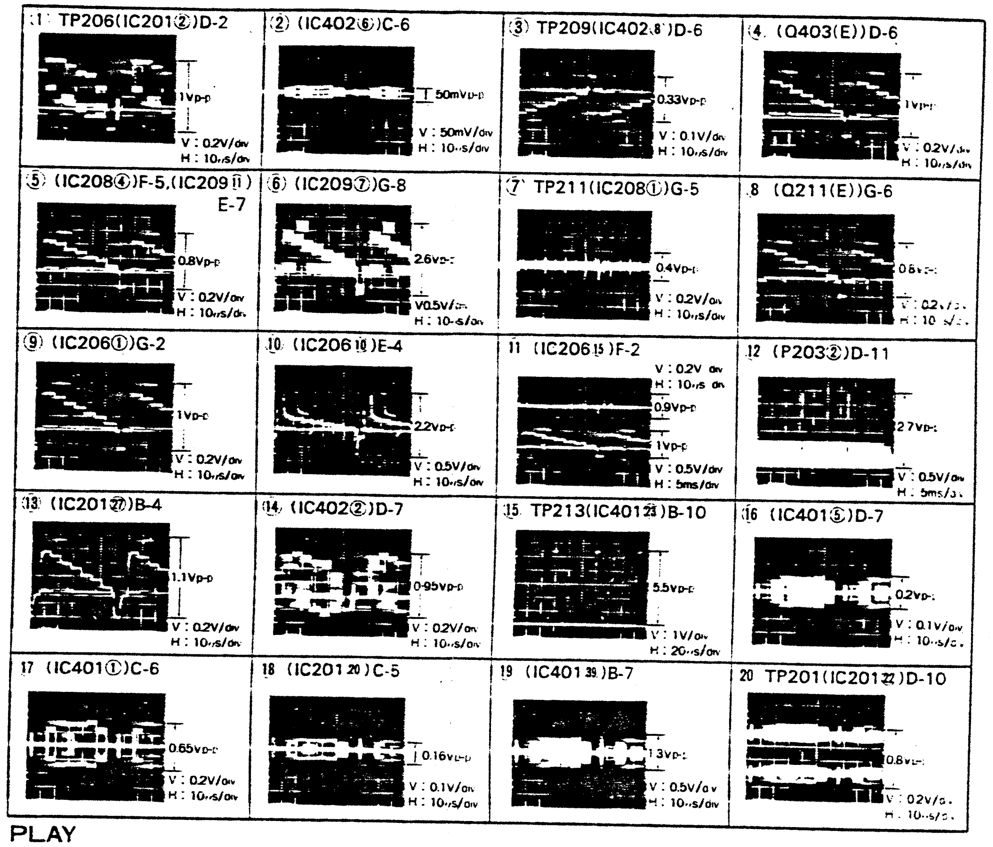
cord Y signal

U102 VIDEO CIRCUIT

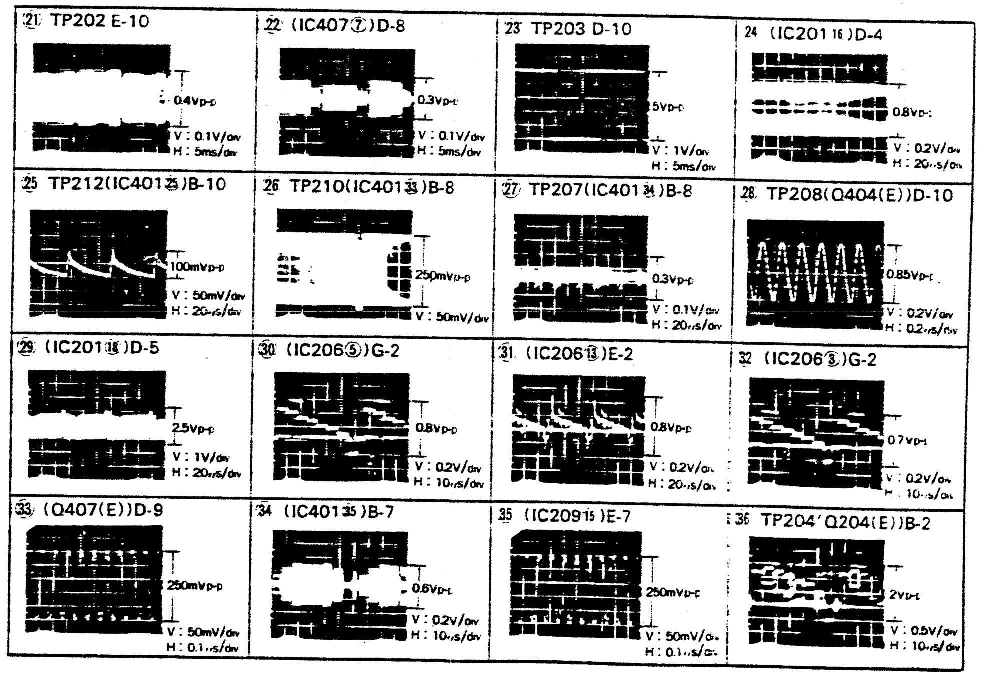
Voltage : Recording Mode
Voltage in ( ): Playback Mode
Voltage in ▭: Trick Mode


IC402 TA7365P
CARRIER BALANCE
COLOR COMB FILTER
Q408 2SC2458Y AMP
IC401 TA7788P COLOR PROCESS
CONV II
CHROMA INVERT
ACK DET
P.I
CONV I
VCO
AFC DET
SYNC DET
APC DET
FREQ DIVID / MISLOCK DET / HD GEN
ACC AMP
SW
ACC DET
VXO / XO
H. HOLD
PILOT BURST MIX
GND
Q410 RN1203
Q202 2SA1048Y BUFFER
Q403 2SC2458Y BUFFER
Q405 2SC2458Y SWITCH
Q406 RN1203 SWITCH
Q407 2SC2458Y BUFFER
Q404 2SC2458Y BUFFER
DELAY EQ
P203
1 A/B/II
2 V-SYNC
3 3.58MHz
4 GND
5 RF-SW
6 CTL
TO U502 SERVO CIRCUIT
P206 TEST TERMINALS
1 RF-SW
2 VIDEO GND
3 ENVELOPE
4 A/B/II
5 CTL
P202
1 VIDEO MUTE
2 AUDIO MUTE
3 TRICK
4 REC 6.5V
5 PB 6.5V
TO U502 SERVO CIRCUIT
TP202
TP203
TP207
TP208
TP209
TP210
TP212
TP213
IC208 TA7741P
RIP
DET
LIM
SYNC CHIP CLAMP
DL DRIVE
GND
Q409 2SC2458Y AMP
IC209 TL8610P
CLOCK LOGIC
BIAS
CLAMP
IN OUT
S/H
AMP
IVREF
GND Vcc
IC102 TA7743P
CH SW
EQ AMP
EQ SW
DOC DET
DOC LIMIT
DOC
DL AMP
LIMIT
AGC
GND
IC101 TA7742P
GND(R) Vcc(P)
REC A
REC B
PRE A
PRE B
Vcc(R) GND(R)
Q210 2SA1048Y BUFFER
IC208 TA7741P Y-COMB
Q211 2SA1048Y BUFFER
LPF
FM DEVIATION
IC209 TL8610P 1H DL CCD
Y-COMB BALANCE
IC102 TA7743P FM PROCESS
IC101 TA7742P(T2946) REC/PRE AMP
P101
1 CH-B(+)
2 CH-B(-)
3 GND
4 GND
5 CH-A(-)
6 CH-B(+)
CH-B
CH-A
+12V
REC +6.5V
A/B/II
PLAY +6.5V
AUDIO MUTE
TO U102 AUDIO CIRCUIT

REC

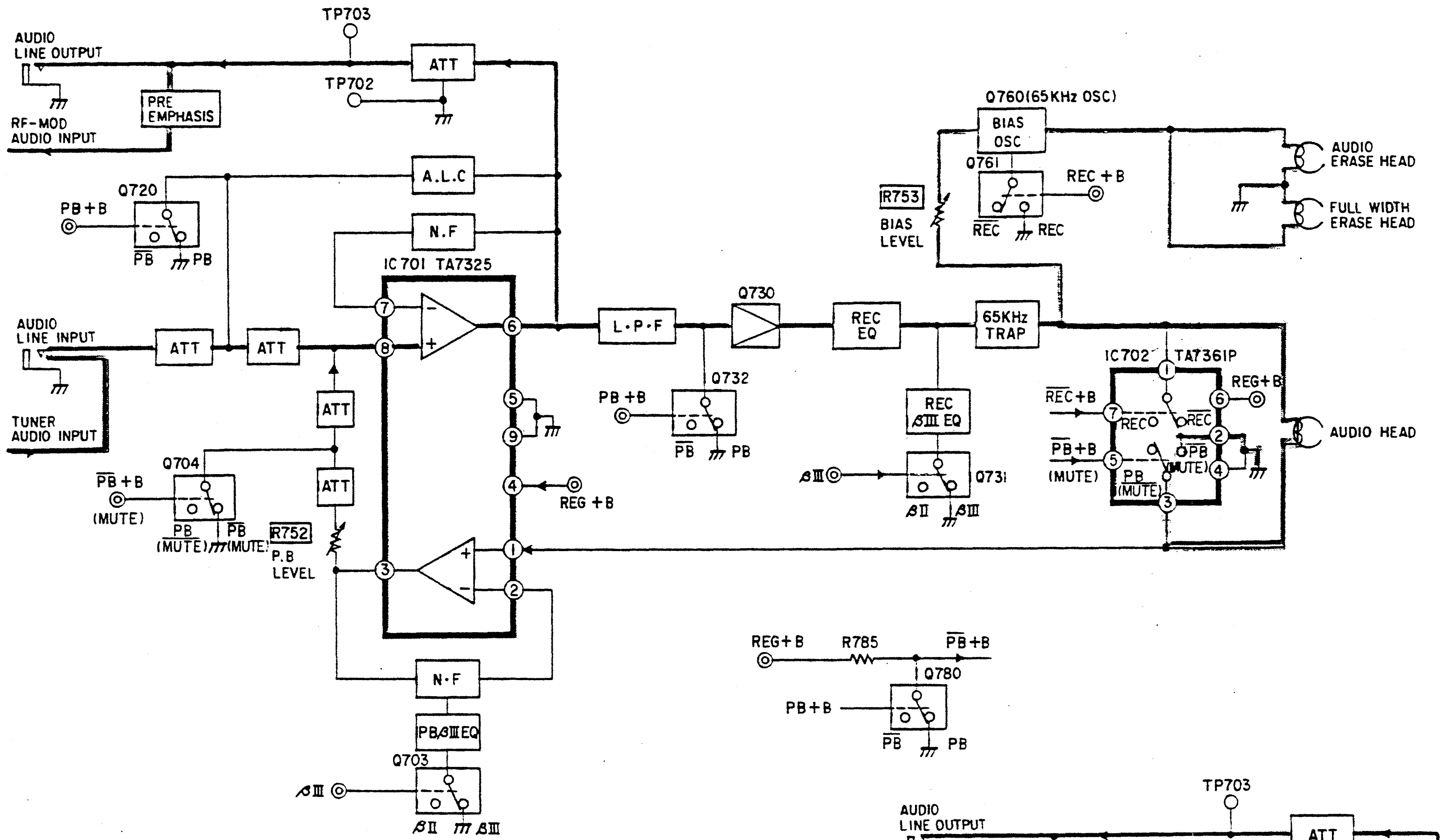


PLAY



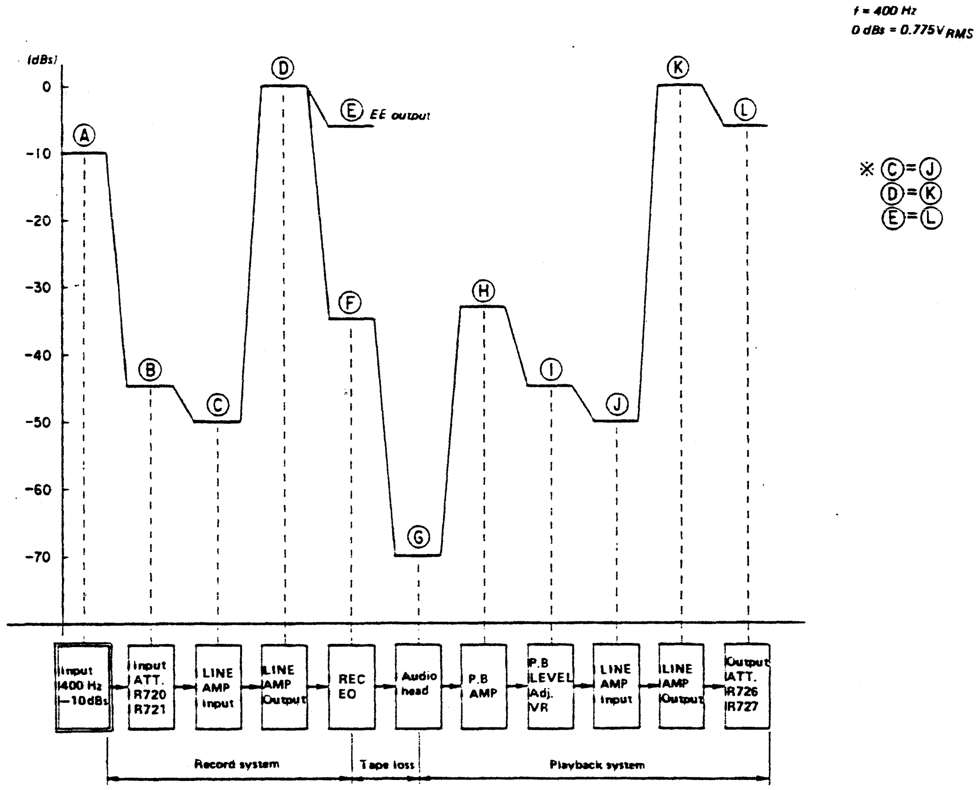
25. Audio Block Diagram

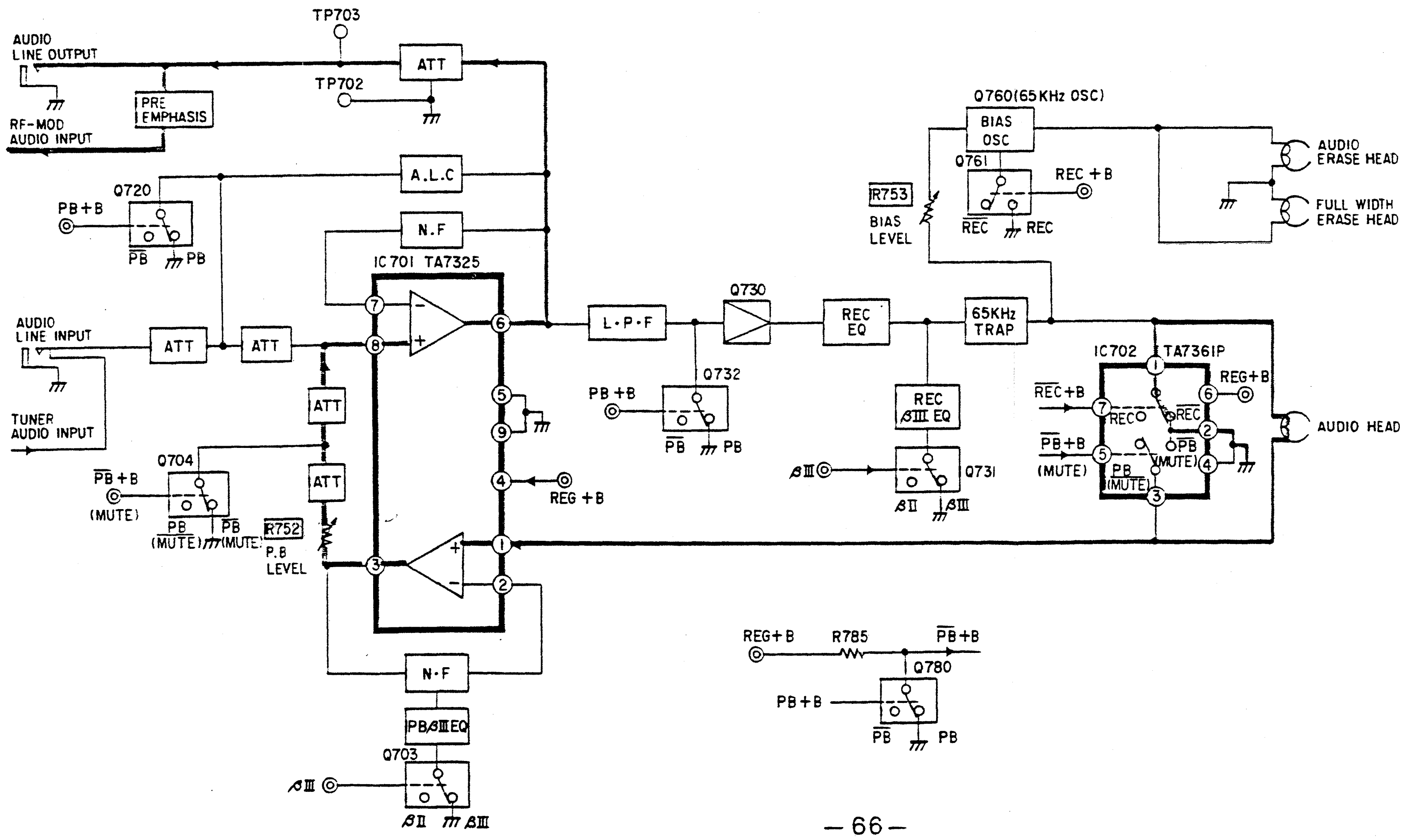
(Record mode)



AUDIO LINE OUTPUT
RF-MOD AUDIO INPUT
PRE EMPHASIS
TP703
TP702
ATT
A.L.C
N.F
Q720
PB+B
PB
PB
IC701 TA7325
AUDIO LINE INPUT
ATT
ATT
TUNER AUDIO INPUT
Q704
PB+B
(MUTE)
PB (MUTE)
PB (MUTE)
R752
P.B LEVEL
REG+B
L·P·F
Q730
Q732
PB+B
REC EQ
REC βIII EQ
βIII
Q731
βII
βIII
65KHz TRAP
Q760(65KHz OSC)
BIAS OSC
Q761
REC+B
REC
REC
R753
BIAS LEVEL
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
IC702 TA7361P
REC+B
REG+B
RECO
REC
PB+B
(MUTE)
OPB
PB (MUTE)
AUDIO HEAD
N·F
PBβIIIEQ
Q703
βIII
βII
βIII
REG+B
R785
PB+B
Q780
PB+B
PB
PB

(Play mode)





TP703
TP702
ATT
AUDIO LINE OUTPUT
RF-MOD AUDIO INPUT
PRE EMPHASIS
A.L.C
N.F
Q720
PB+B
PB
PB
IC701 TA7325
AUDIO LINE INPUT
ATT
ATT
TUNER AUDIO INPUT
Q704
PB+B
(MUTE)
PB (MUTE)
PB (MUTE)
R752
P.B LEVEL
REG+B
L·P·F
Q730
Q732
PB+B
REC EQ
REC βIII EQ
βIII
Q731
βII
βIII
65KHz TRAP
Q760(65KHz OSC)
BIAS OSC
Q761
REC+B
REC
REC
R753
BIAS LEVEL
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
IC702 TA7361P
REC+B
REG+B
RECO
REC
PB+B
(MUTE)
OPB
PB (MUTE)
AUDIO HEAD
N·F
PBβIIIEQ
Q703
βIII
βII
βIII
REG+B
R785
PB+B
Q780
PB+B
PB
PB

A

B

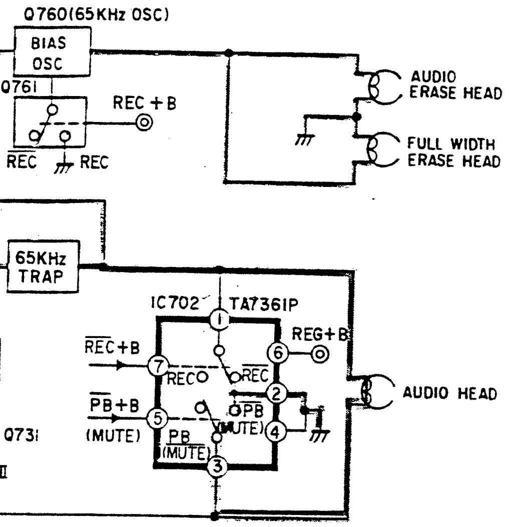
C

D

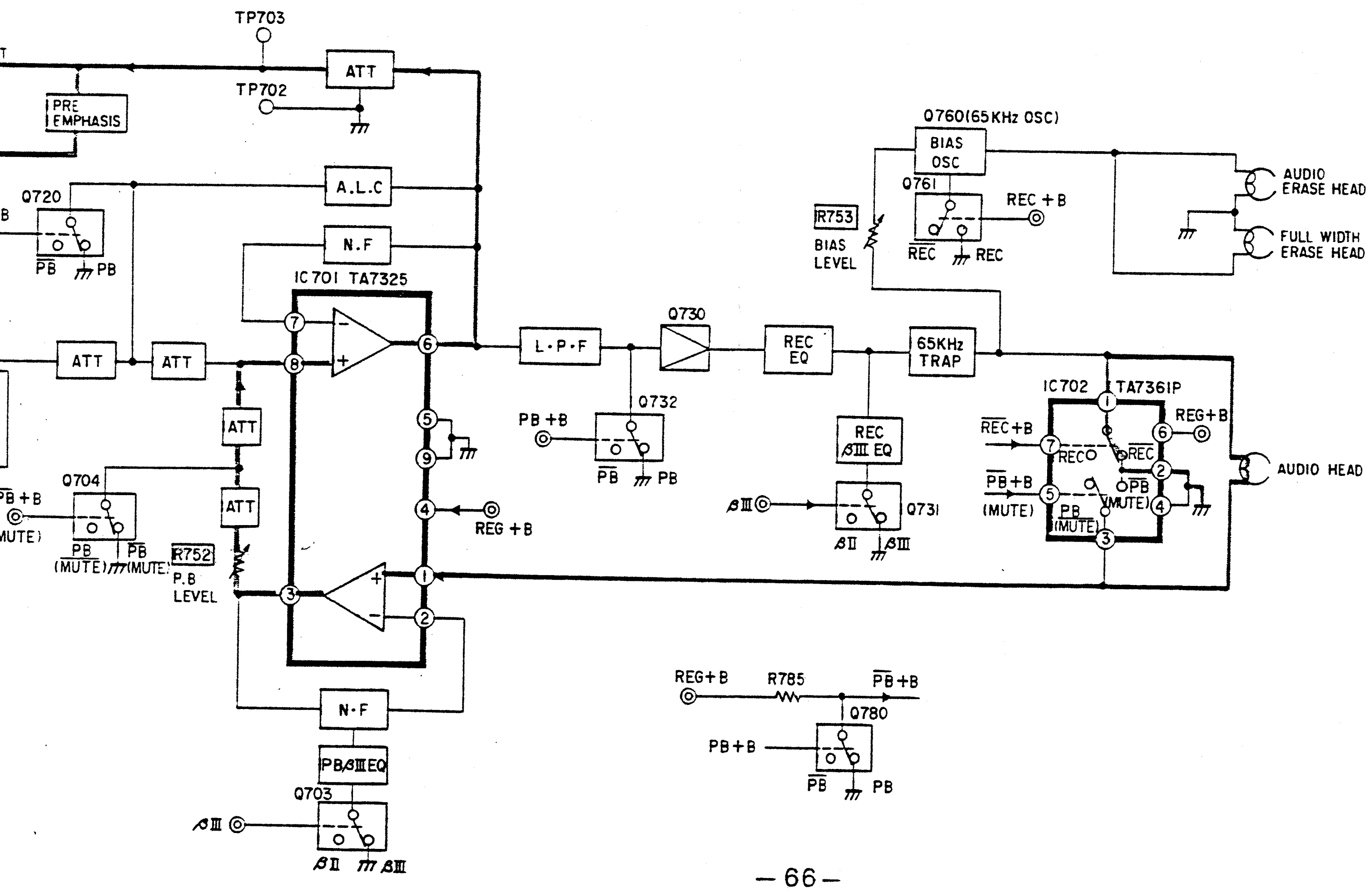
E

F

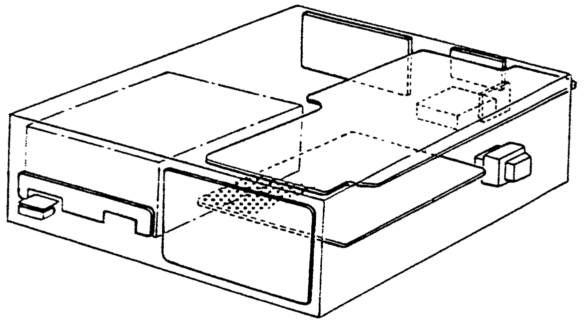
G


Q760(65KHz OSC)
BIAS OSC
Q761
REC +B
REC
REC
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
65KHz TRAP
IC702
TA7361P
REC+B
REG+B
REC
REC
PB+B
PB
(MUTE)
Q731
(MUTE)
PB (MUTE)
AUDIO HEAD

(Play mode)


TP703
TP702
ATT
PRE EMPHASIS
A.L.C
N.F
Q720
PB
PB
IC701 TA7325
ATT
ATT
ATT
ATT
Q704
PB+B
(MUTE)
PB (MUTE)
PB (MUTE)
R752
P.B LEVEL
N·F
PBβIIIEQ
Q703
βIII
βII
βIII
L·P·F
Q730
Q732
PB+B
PB
PB
REC EQ
REC βIII EQ
βIII
Q731
βII
βIII
REG +B
65KHz TRAP
Q760(65KHz OSC)
BIAS OSC
Q761
REC +B
REC
REC
R753
BIAS LEVEL
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
IC702
TA7361P
REC+B
REG+B
REC
REC
PB+B
PB
(MUTE)
PB (MUTE)
AUDIO HEAD
REG+B
R785
PB+B
Q780
PB+B
PB
PB

26. Audio PC Board



Location of ICs

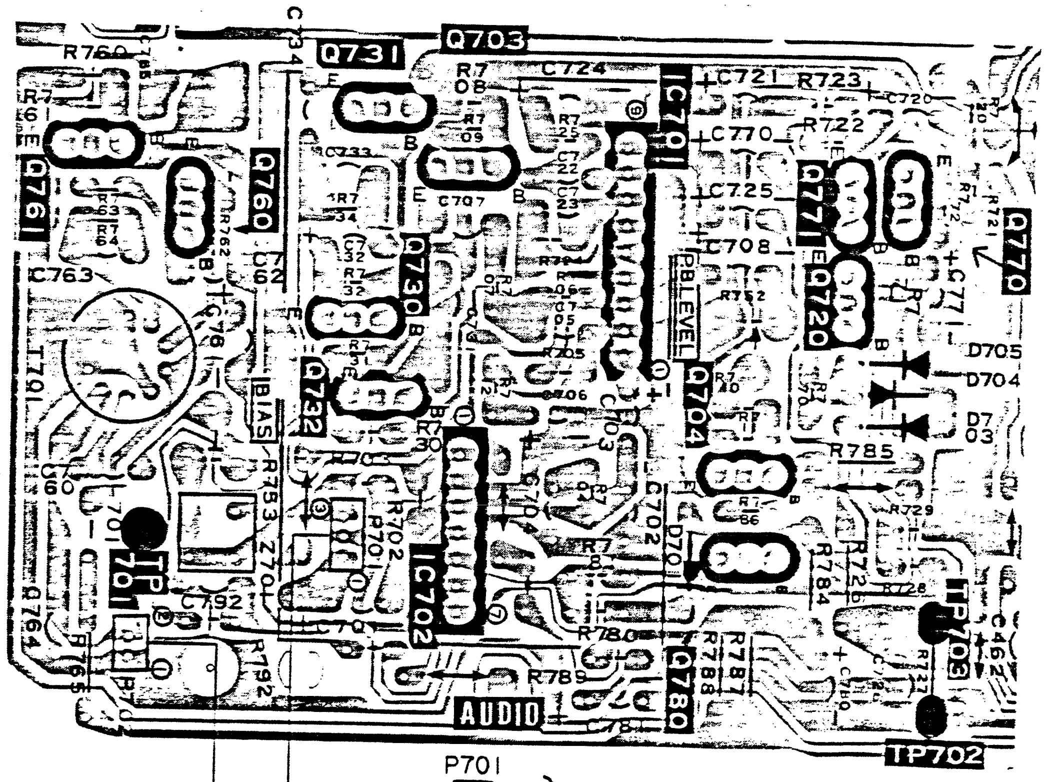
Symbol No.	Location
Q703	D-2
Q704	E-3
Q720	E-4
Q730	E-2
Q731	D-2
Q732	E-2
Q760	D-1
Q761	D-1
Q770	D-4
Q771	D-4
Q780	F-3

Location of Transistors

Symbol No.	Location
R752	E-3
R753	E-2

Location of Diodes

Symbol No.	Location
D701	F-3
D703	E-4
D704	E-4
D705	E-4


A
B
C
D
E
F
G
Q731
Q703
R760
C724
C721
R723
IC701
Q761
Q760
Q730
Q732
Q770
Q771
Q720
Q704
C770
C725
C708
C763
PB LEVEL
BIAS
R753
IC702
TP701
Q780
AUDIO
R785
R789
R780
D705
D704
D703
TP703
TP702
C792
P701
3
2
1
P702
2
1

P701

TO H031
AUDIO HEAD

P702

TO H031
AUDIO ERASE HEAD

TO H032
FULL WIDTH ERASE HEAD

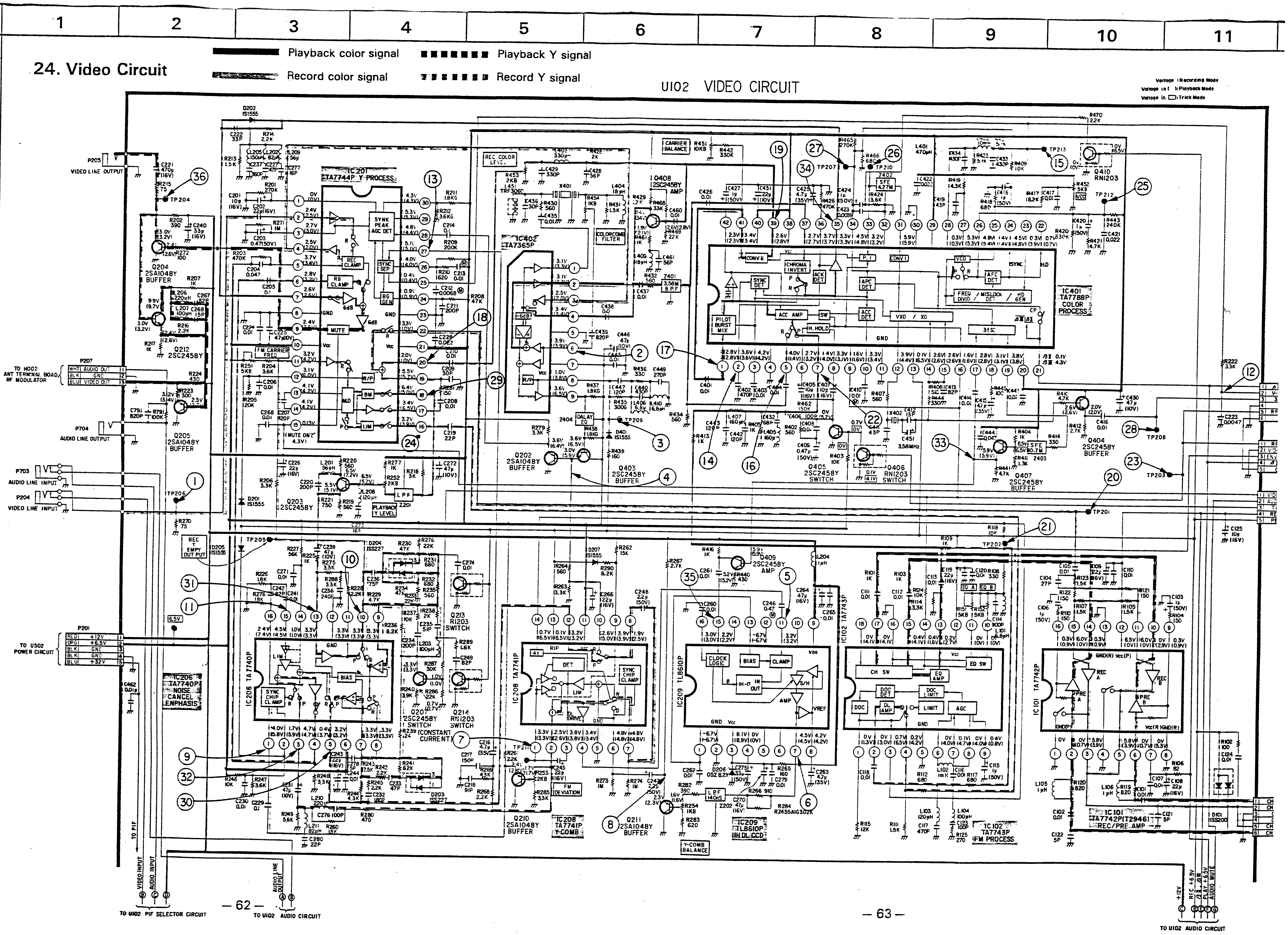
24. Video Circuit

Playback color signal

Playback Y signal

Record color signal

Record Y signal


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
U102 VIDEO CIRCUIT
Voltage : Recording Mode
Voltage in ( ): Playback Mode
Voltage in ▭: Trick Mode
IC201 TA7744P Y-PROCESS
IC402 TA7365P
IC401 TA7788P COLOR PROCESS
IC206 TA7740P NOISE CANCEL EMPHASIS
IC208 TA7741P Y-COMB
IC209 TL8610P 1H DL CCD
IC102 TA7743P FM PROCESS
IC101 TA7742P(T2946) REC/PRE-AMP
Q204 2SA1048Y BUFFER
Q212 2SC2458Y
Q205 2SA1048Y BUFFER
Q203 2SC2458Y
Q202 2SA1048Y BUFFER
Q403 2SC2458Y BUFFER
Q408 2SC2458Y AMP
Q405 2SC2458Y SWITCH
Q406 RN1203 SWITCH
Q407 2SC2458Y BUFFER
Q404 2SC2458Y BUFFER
Q410 RN1203
Q213 RN1203 SWITCH
Q207 2SC2458Y SWITCH (CONSTANT CURRENT)
Q214 RN1203 SWITCH
Q210 2SA1048Y BUFFER
Q211 2SA1048Y BUFFER
Q409 2SC2458Y AMP
P205 VIDEO LINE OUTPUT
P207 TO H002 ANT TERMINAL BOAD/RF MODULATOR
P704 AUDIO LINE OUTPUT
P703 AUDIO LINE INPUT
P204 VIDEO LINE INPUT
P201 TO U502 POWER CIRCUIT
RED +12V
ORG +6.5V
BLK GND
BLK GND
BLU +32V
REC COLOR LEVEL
CARRIER BALANCE
REC Y EMPTY OUT PUT
PLAYBACK Y LEVEL
Y-COMB BALANCE
FM DEVIATION
TP204
TP206
TP205
TP207
TP210
TP213
TP212
TP209
TP208
TP203
TP201
TP202
TO PIF
VIDEO INPUT
AUDIO INPUT
AUDIO LINE OUTPUT
TO U102 PIF SELECTOR CIRCUIT
TO U102 AUDIO CIRCUIT
+12V
REC +6.5V
PLAY +6.5V
AUDIO MUTE
TO U102 AUDIO CIRCUIT

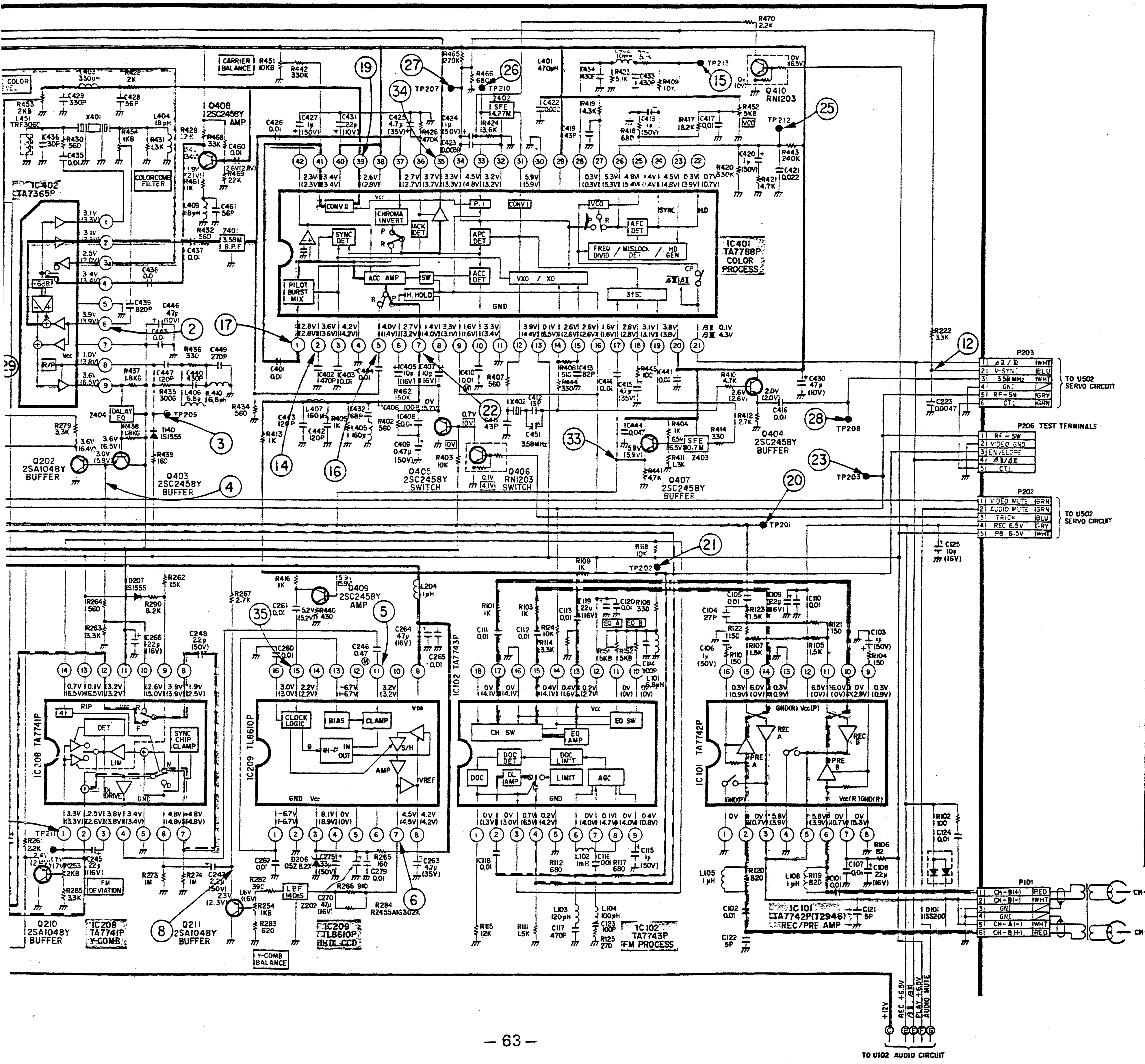
5	6	7	8	9	10	11	12	13	14	15	16

Playback Y signal

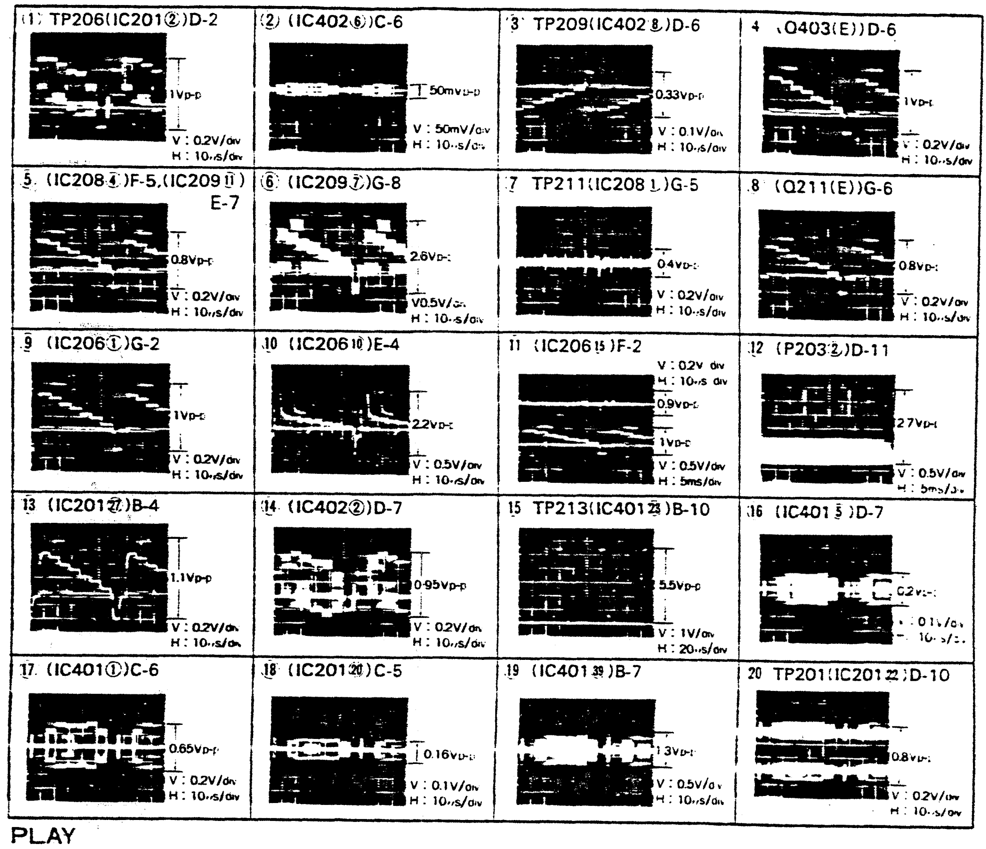
Record Y signal

U102 VIDEO CIRCUIT

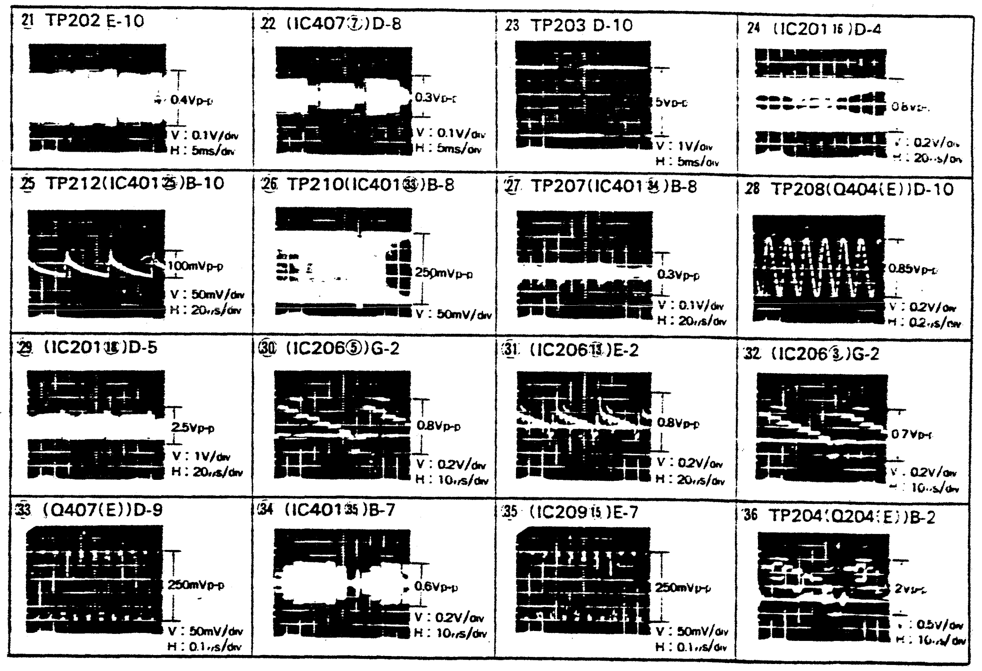
Voltage : Recording Mode
Voltage in ( ): Playback Mode
Voltage in ▭: Trick Mode


IC402 TA7365P
IC401 TA7788P COLOR PROCESS
CARRIER BALANCE
COLORCOMB FILTER
Q408 2SC2458Y AMP
Q410 RN1203
Q202 2SA1048Y BUFFER
Q403 2SC2458Y BUFFER
Q405 2SC2458Y SWITCH
Q406 RN1203 SWITCH
Q407 2SC2458Y BUFFER
Q404 2SC2458Y BUFFER
Q409 2SC2458Y AMP
Q210 2SA1048Y BUFFER
Q211 2SA1048Y BUFFER
IC208 TA7741P Y-COMB
IC209 TL8610P 1H DL CCD
IC102 TA7743P FM PROCESS
IC101 TA7742P(T2946) REC/PRE-AMP
Y-COMB BALANCE
CONV II
CHROMA INVERT
ACK DET
APC DET
CONV I
VCO
AFC DET
FREQ DIVID / MISLOCK DET / HD GEN
SYNC DET
ACC AMP
SW
ACC DET
VXO / XO
PILOT BURST MIX
H. HOLD
3.58M B.P.F
SFE 4.27M
DELAY EQ
DET
LIM
SYNC CHIP CLAMP
IDL DRIVE
CLOCK LOGIC
BIAS
CLAMP
S/H
AMP
VREF
CH SW
EQ AMP
EQ SW
DOC DET
DOC LIMIT
DOC
DL AMP
LIMIT
AGC
REC A
REC B
PRE A
PRE B
FM DEVIATION
LPF
P203
V-SYNC
3.58 MHz
GND
RF-SW
CTL
TO U502 SERVO CIRCUIT
P206 TEST TERMINALS
RF-SW
VIDEO GND
ENVELOPE
CTL
P202
VIDEO MUTE
AUDIO MUTE
TRICK
REC 6.5V
PB 6.5V
TO U502 SERVO CIRCUIT
P101
CH-B(+)
CH-B(-)
GND
GND
CH-A(-)
CH-A(+)
CH-B
CH-A
+12V
REC +6.5V
PLAY +6.5V
AUDIO MUTE
TO U102 AUDIO CIRCUIT
TP201
TP202
TP203
TP205
TP207
TP208
TP210
TP211
TP212
TP213

REC

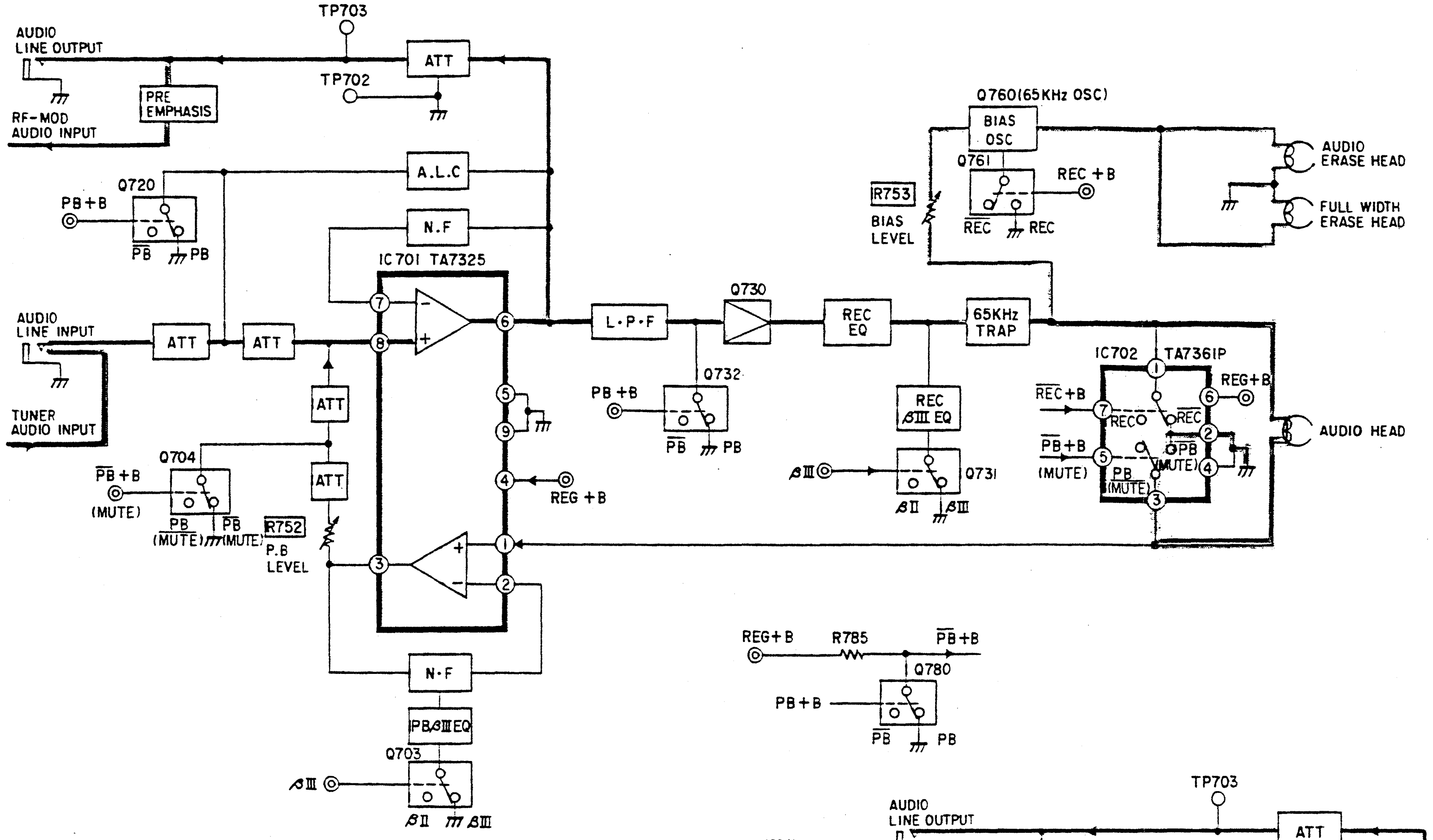


PLAY



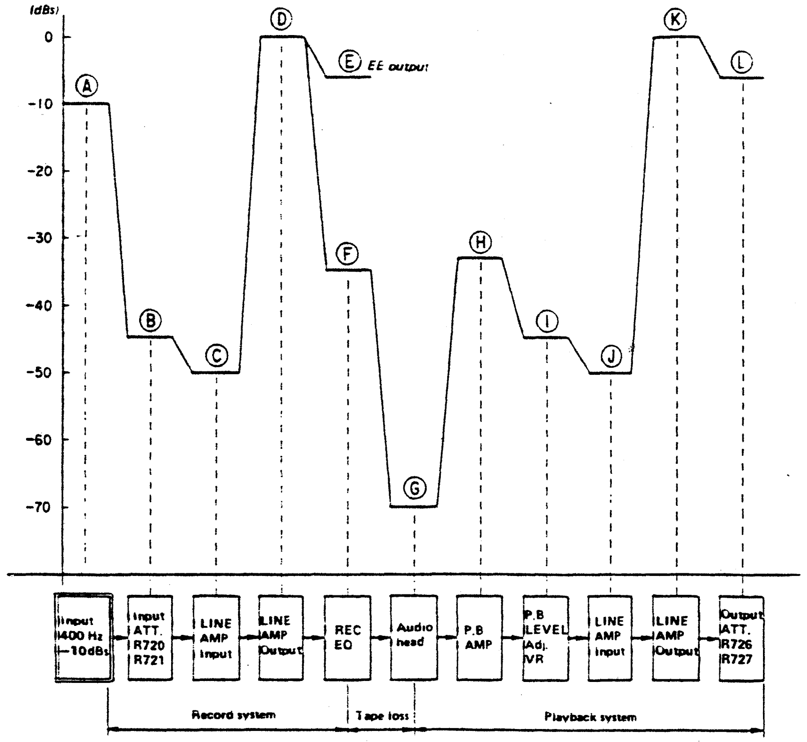
25. Audio Block Diagram

(Record mode)


TP703
AUDIO LINE OUTPUT
ATT
TP702
RF-MOD AUDIO INPUT
PRE EMPHASIS
A.L.C
Q720
PB+B
PB
PB
N.F
IC701 TA7325
AUDIO LINE INPUT
ATT
ATT
TUNER AUDIO INPUT
ATT
ATT
Q704
PB+B
(MUTE)
PB (MUTE)
PB (MUTE)
R752
P.B LEVEL
REG+B
N·F
PBβIIIEQ
Q703
βIII
βII
βIII
L·P·F
Q730
Q732
PB+B
PB
PB
REC EQ
REC βIII EQ
βIII
Q731
βII
βIII
65KHz TRAP
Q760(65KHz OSC)
BIAS OSC
Q761
REC+B
REC
REC
R753
BIAS LEVEL
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
IC702 TA7361P
REC+B
PB+B
(MUTE)
REC
REC
PB
PB (MUTE)
(MUTE)
REG+B
AUDIO HEAD
REG+B
R785
PB+B
Q780
PB+B
PB
PB

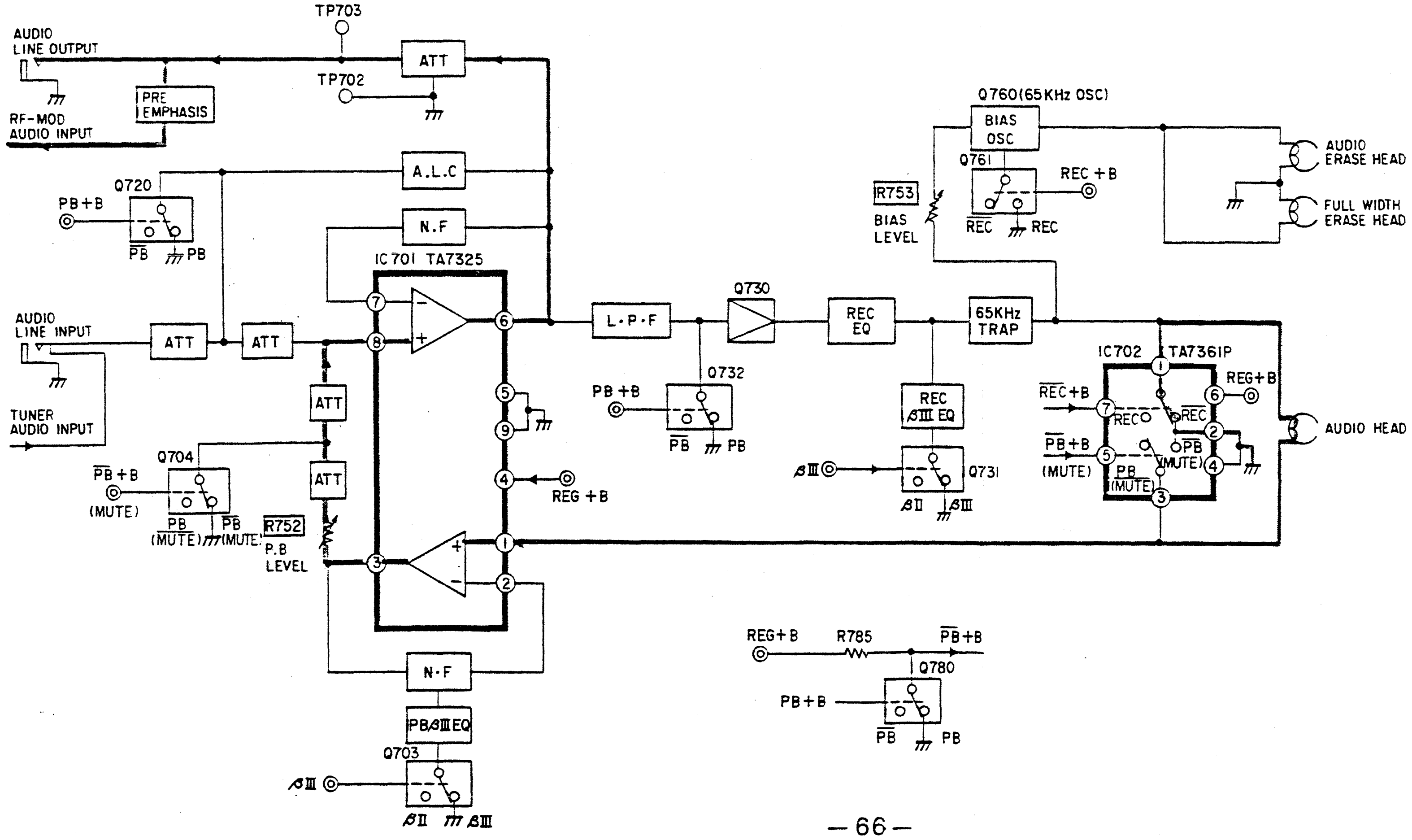
f = 400 Hz

0 dBs = 0.775 V_{RMS}

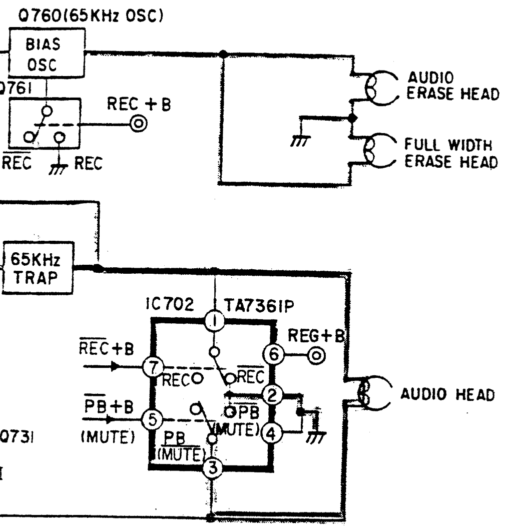


※ Ⓒ=Ⓙ
Ⓓ=Ⓚ
Ⓔ=Ⓛ

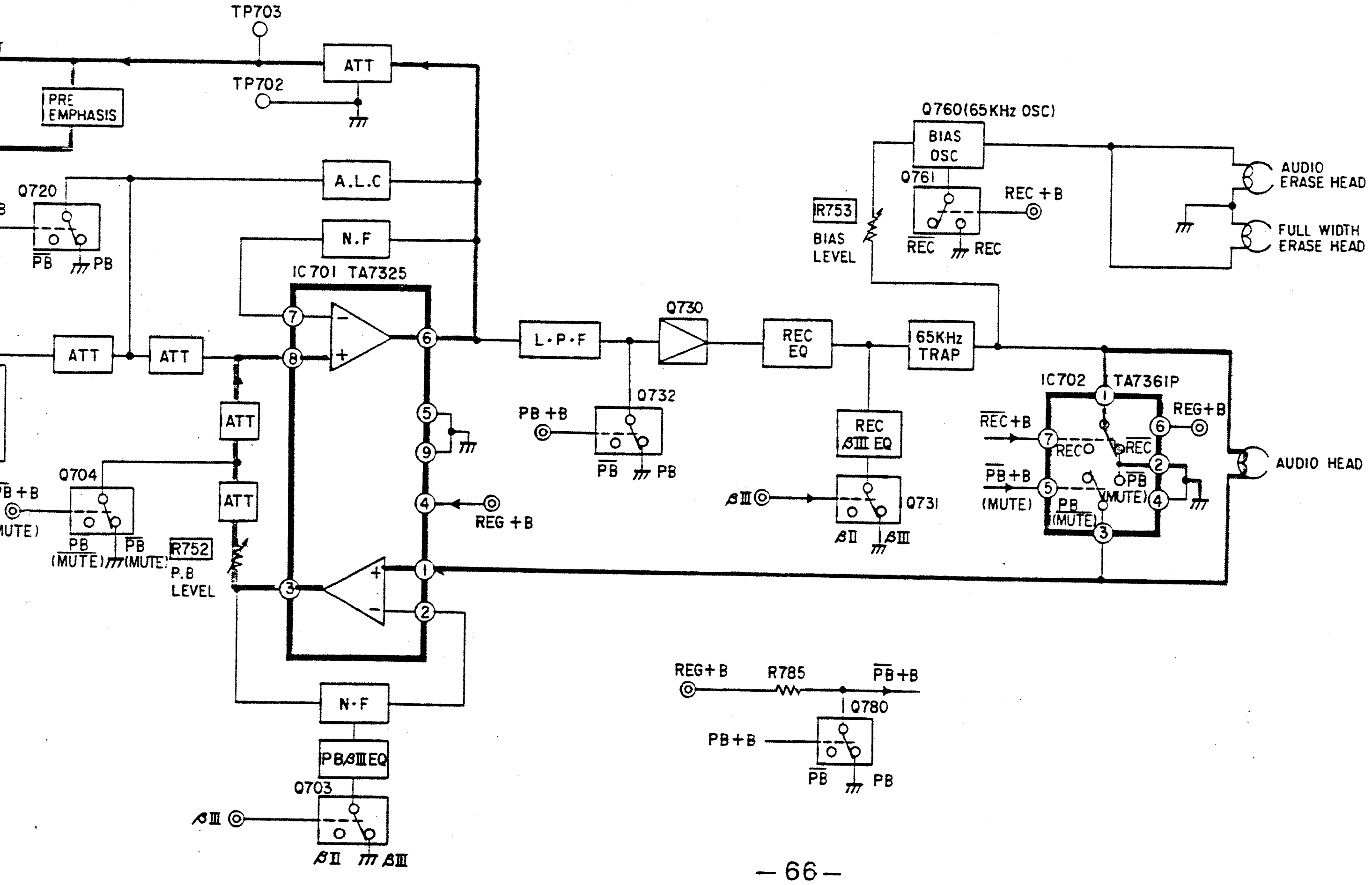
(Play mode)


TP703
AUDIO LINE OUTPUT
ATT
TP702
RF-MOD AUDIO INPUT
PRE EMPHASIS
A.L.C
Q720
PB+B
PB
PB
N.F
IC701 TA7325
AUDIO LINE INPUT
ATT
ATT
TUNER AUDIO INPUT
ATT
ATT
Q704
PB+B
(MUTE)
PB (MUTE)
PB (MUTE)
R752
P.B LEVEL
REG+B
N·F
PBβIIIEQ
Q703
βIII
βII
βIII
L·P·F
Q730
Q732
PB+B
PB
PB
REC EQ
REC βIII EQ
βIII
Q731
βII
βIII
65KHz TRAP
Q760(65KHz OSC)
BIAS OSC
Q761
REC+B
REC
REC
R753
BIAS LEVEL
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
IC702 TA7361P
REC+B
PB+B
(MUTE)
REC
REC
PB
PB (MUTE)
(MUTE)
REG+B
AUDIO HEAD
REG+B
R785
PB+B
Q780
PB+B
PB
PB

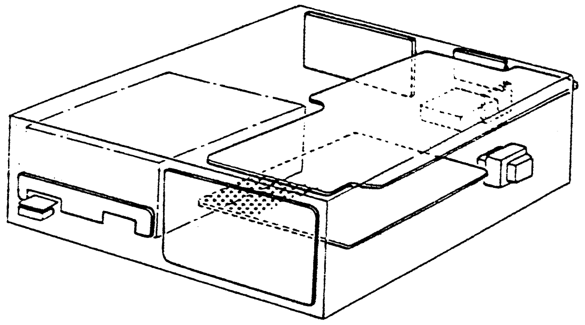
A
B
C
D
E
F
G


Q760(65KHz OSC)
BIAS OSC
Q761
REC +B
REC
REC
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
65KHz TRAP
IC702 TA7361P
REC+B
REG+B
PB+B
(MUTE)
RECO
REC
PB
PB (MUTE)
AUDIO HEAD
Q731

(Play mode)


TP703
TP702
ATT
PRE EMPHASIS
A.L.C
N.F
Q720
PB
PB
IC701 TA7325
ATT
ATT
ATT
ATT
Q704
PB+B
(MUTE)
PB (MUTE)
PB (MUTE)
R752
P.B LEVEL
REG +B
N·F
PBβIII EQ
Q703
βIII
βII
βIII
L·P·F
Q730
Q732
PB +B
PB
PB
REC EQ
REC βIII EQ
βIII
Q731
βII
βIII
65KHz TRAP
R753
BIAS LEVEL
Q760(65KHz OSC)
BIAS OSC
Q761
REC +B
REC
REC
AUDIO ERASE HEAD
FULL WIDTH ERASE HEAD
IC702 TA7361P
REC+B
REG+B
PB+B
(MUTE)
RECO
REC
PB
PB (MUTE)
AUDIO HEAD
REG+B
R785
PB+B
Q780
PB+B
PB
PB

26. Audio PC Board



Location of ICs

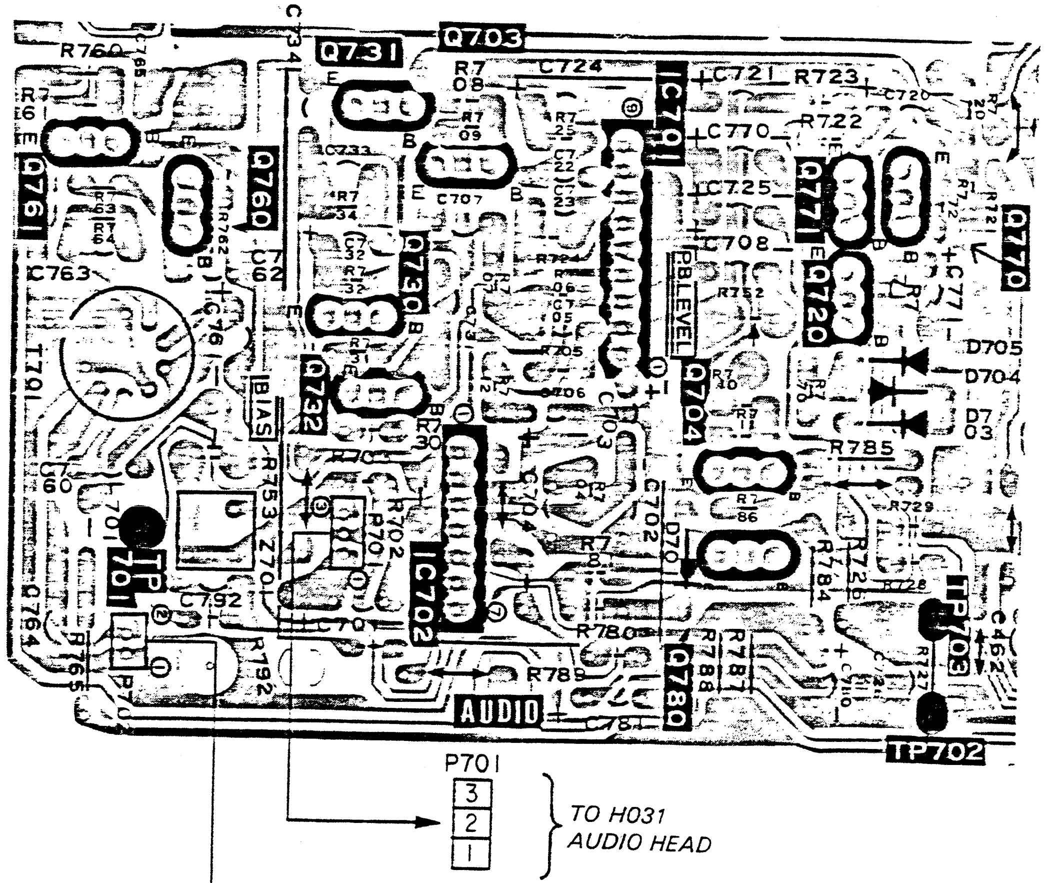
Symbol No.	Location
Q703	D-2
Q704	E-3
Q720	E-4
Q730	E-2
Q731	D-2
Q732	E-2
Q760	D-1
Q761	D-1
Q770	D-4
Q771	D-4
Q780	F-3

Location of Transistors

Symbol No.	Location
R752	E-3
R753	E-2

Location of Diodes

Symbol No.	Location
D701	F-3
D703	E-4
D704	E-4
D705	E-4


1
2
3
4
5
A
B
C
D
E
F
G
Q731
Q703
Q760
Q761
IC701
Q730
Q732
Q771
Q720
Q770
Q704
IC702
Q780
BIAS
PB LEVEL
TP701
TP703
TP702
AUDIO
D705
D704
D703
R785
C724
C721
R723
R722
C770
C725
C708
C763
T701
R753
R789
R780

P701
3
2
1

TO H031
AUDIO HEAD

P702
2
1

TO H031
AUDIO ERASE HEAD

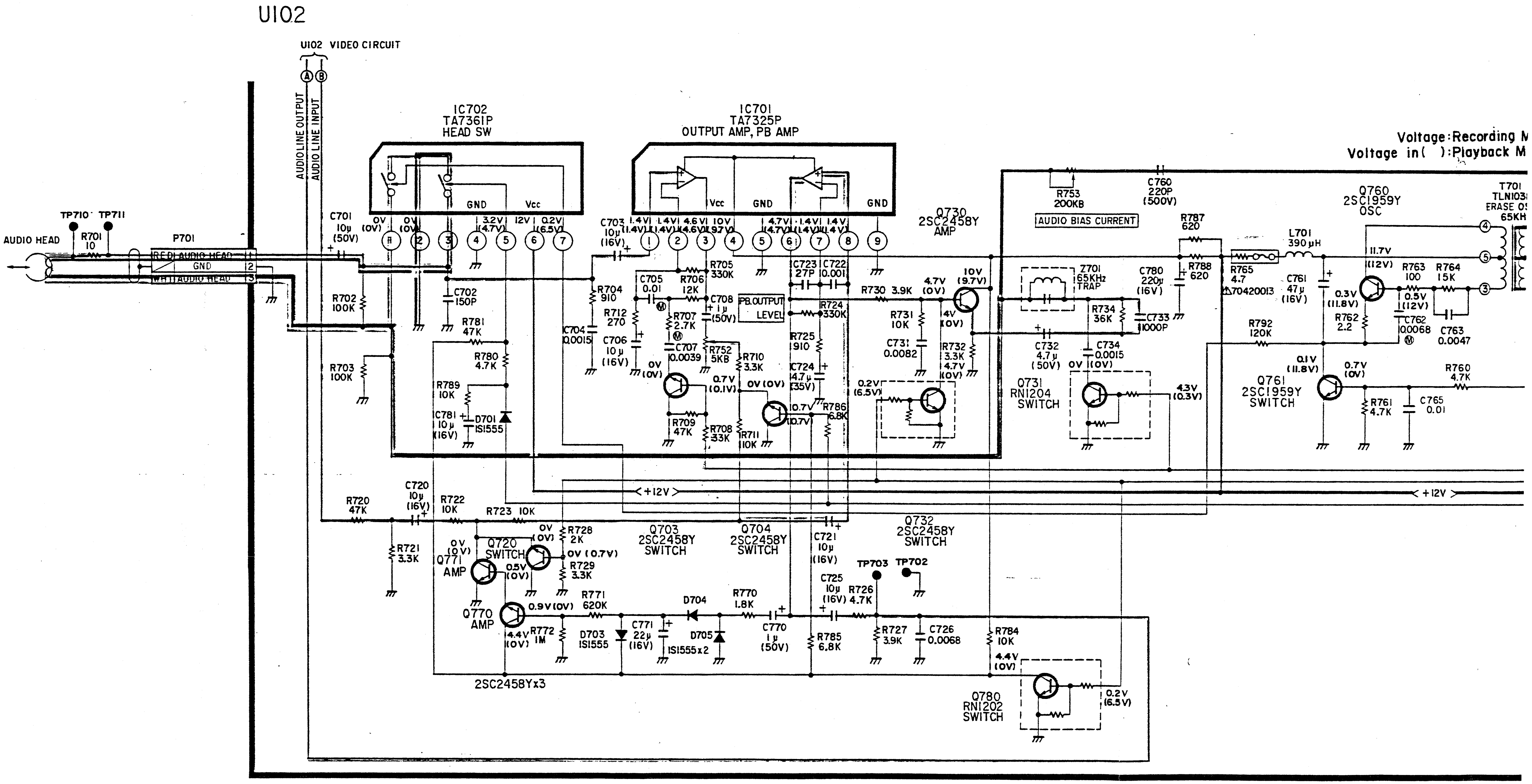
TO H032
FULL WIDTH ERASE HEAD

27. Audio Circuit

▬ Audio playback signal

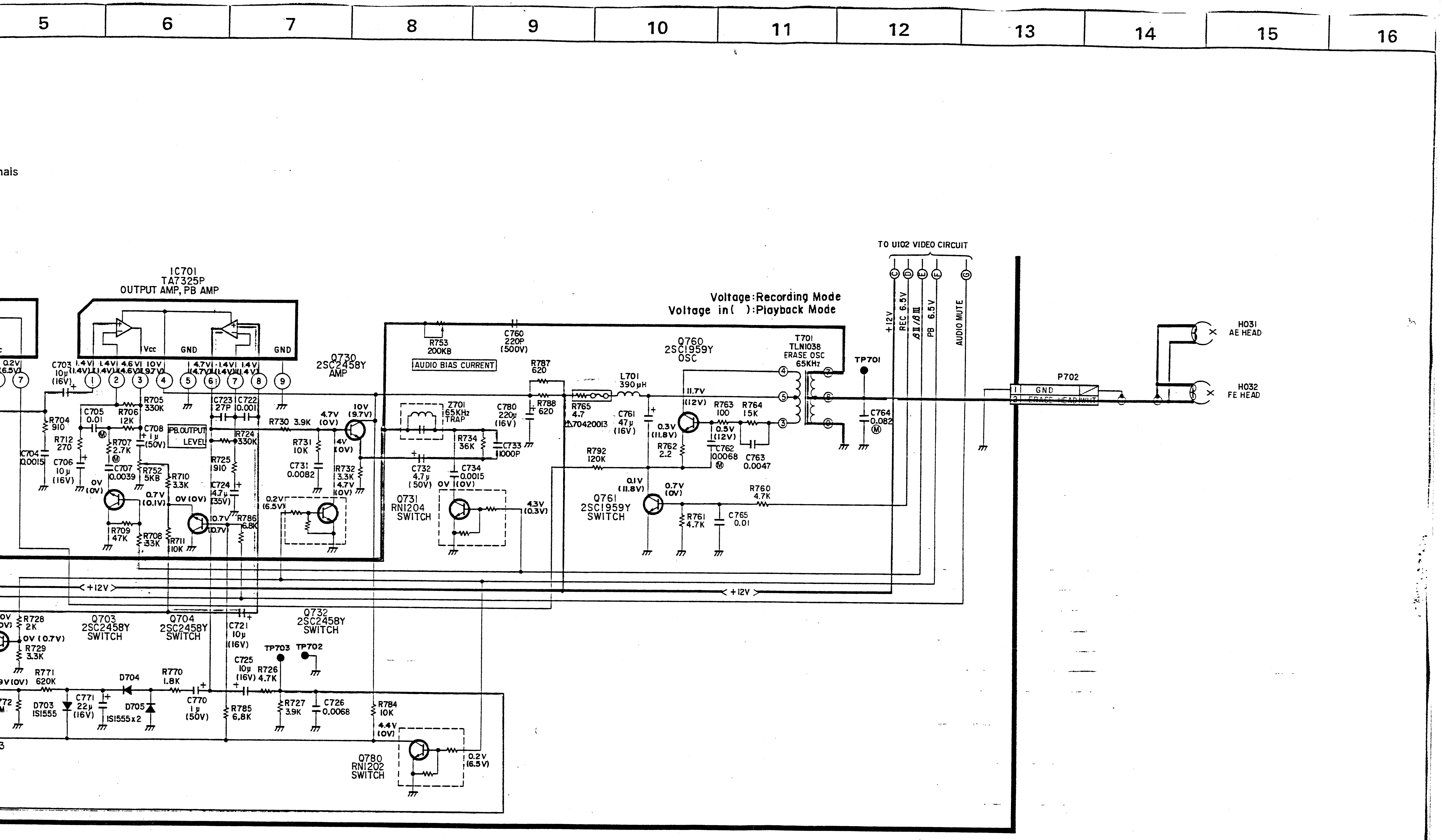
▬ Audio record signal

▬ Record bias and erase signals



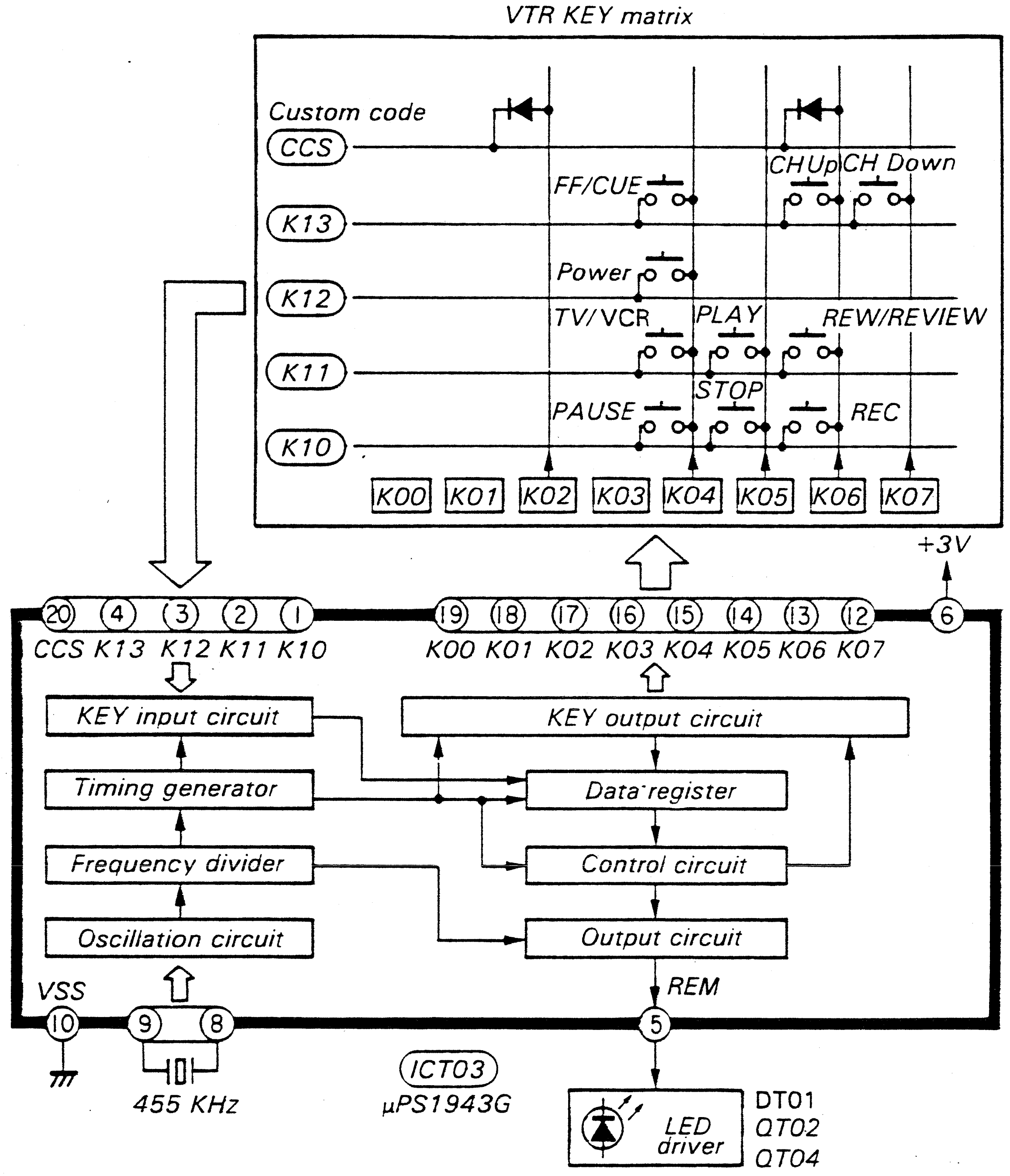
1 2 3 4 5 6 7 8 9 10 11
A B C D E F G
U102
U102 VIDEO CIRCUIT
AUDIO LINE OUTPUT
AUDIO LINE INPUT
Voltage:Recording M
Voltage in( ):Playback M
IC702
TA7361P
HEAD SW
GND
Vcc
IC701
TA7325P
OUTPUT AMP, PB AMP
Vcc
GND
GND
TP710 TP711
AUDIO HEAD
R701 10
P701
RED AUDIO HEAD
GND
WHT AUDIO HEAD
C701 10μ (50V)
R702 100K
R703 100K
C702 150P
R781 47K
R780 4.7K
R789 10K
C781 10μ (16V)
D701 IS1555
C703 10μ (16V)
R704 910
R712 270
C704 0.0015
C705 0.01
C706 10μ (16V)
R706 12K
R705 330K
R707 2.7K
C707 0.0039
C708 1μ (50V)
R752 5KB
PB OUTPUT LEVEL
R710 3.3K
R709 47K
R708 33K
R711 10K
C723 27P
C722 0.001
R724 330K
R725 910
C724 4.7μ (35V)
R786 6.8K
Q730 2SC2458Y AMP
R730 3.9K
R731 10K
C731 0.0082
R732 3.3K
R753 200KB
AUDIO BIAS CURRENT
C760 220P (500V)
R787 620
R788 620
Z701 65KHz TRAP
C780 220μ (16V)
R734 36K
C733 1000P
C732 4.7μ (50V)
C734 0.0015
Q731 RN1204 SWITCH
R765 4.7
70420013
L701 390μH
C761 47μ (16V)
R792 120K
Q760 2SC1959Y OSC
R763 100
R764 15K
R762 2.2
C762 0.0068
C763 0.0047
Q761 2SC1959Y SWITCH
R761 4.7K
C765 0.01
R760 4.7K
T701 TLN103
ERASE O
65KH
<+12V>
R720 47K
C720 10μ (16V)
R721 3.3K
R722 10K
R723 10K
Q771 AMP
Q720 SWITCH
R728 2K
R729 3.3K
Q703 2SC2458Y SWITCH
Q704 2SC2458Y SWITCH
C721 10μ (16V)
Q732 2SC2458Y SWITCH
TP703 TP702
C725 10μ (16V)
R726 4.7K
Q770 AMP
R772 1M
R771 620K
D703 IS1555
C771 22μ (16V)
D704
D705 IS1555x2
R770 1.8K
C770 1μ (50V)
R785 6.8K
R727 3.9K
C726 0.0068
R784 10K
Q780 RN1202 SWITCH
2SC2458Yx3

nals



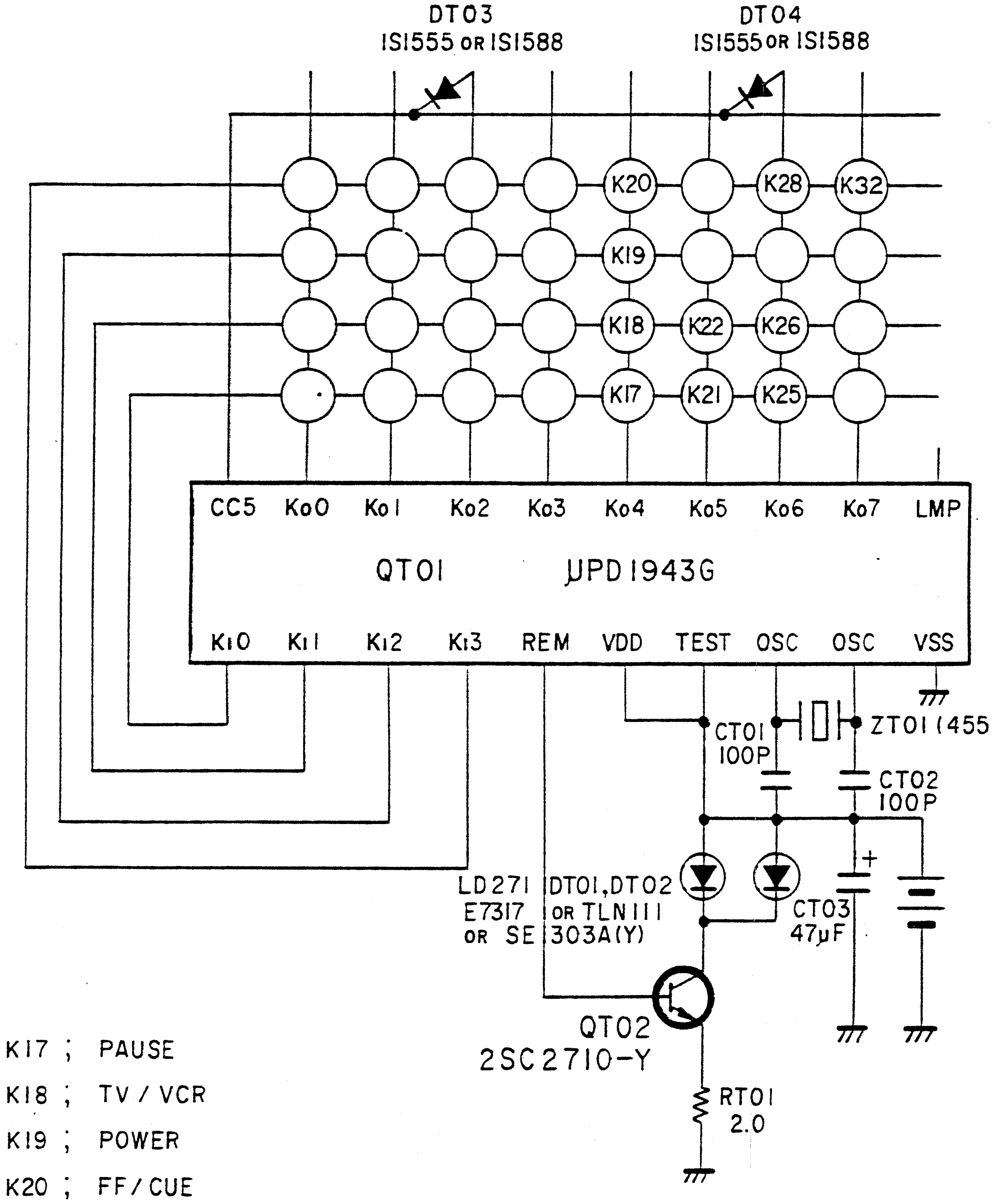
5
6
7
8
9
10
11
12
13
14
15
16
IC701
TA7325P
OUTPUT AMP, PB AMP
Vcc
GND
GND
Q730
2SC2458Y
AMP
R753
200KB
AUDIO BIAS CURRENT
C760
220P
(500V)
R787
620
R788
620
C780
220μ
(16V)
Z701
65KHz
TRAP
R734
36K
C733
1000P
C732
4.7μ
(50V)
C734
0.0015
Q731
RN1204
SWITCH
R765
4.7
70420013
L701
390μH
C761
47μ
(16V)
R792
120K
Voltage:Recording Mode
Voltage in( ):Playback Mode
Q760
2SC1959Y
OSC
R763
100
R764
15K
R762
2.2
C762
0.0068
C763
0.0047
Q761
2SC1959Y
SWITCH
R761
4.7K
C765
0.01
R760
4.7K
T701
TLN1038
ERASE OSC
65KHz
TP701
C764
0.082
TO U102 VIDEO CIRCUIT
+12V
REC 6.5V
B II/B III
PB 6.5V
AUDIO MUTE
P702
GND
ERASE HEAD(WHT)
H031
AE HEAD
H032
FE HEAD
C703
10μ
(16V)
C705
0.01
R704
910
R712
270
C704
0.0015
C706
10μ
(16V)
R705
330K
R706
12K
R707
2.7K
C707
0.0039
C708
1μ
(50V)
R752
5K8
R710
3.3K
PB OUTPUT LEVEL
R724
330K
R725
910
C724
4.7μ
(35V)
C723
27P
C722
0.001
R730 3.9K
R731
10K
C731
0.0082
R732
3.3K
R786
6.8K
R709
47K
R708
33K
R711
10K
<+12V>
Q703
2SC2458Y
SWITCH
Q704
2SC2458Y
SWITCH
Q732
2SC2458Y
SWITCH
R728
2K
R729
3.3K
R771
620K
D703
1S1555
C771
22μ
(16V)
D704
D705
1S1555x2
R770
1.8K
C770
1μ
(50V)
C721
10μ
(16V)
C725
10μ
(16V)
R726
4.7K
TP703
TP702
R785
6.8K
R727
3.9K
C726
0.0068
R784
10K
Q780
RN1202
SWITCH

28. Remote Control Block Diagram


VTR KEY matrix
Custom code
CCS
K13
K12
K11
K10
FF/CUE
Power
TV/VCR
PLAY
REW/REVIEW
PAUSE
STOP
REC
CH Up
CH Down
K00
K01
K02
K03
K04
K05
K06
K07
+3V
20
4
3
2
1
19
18
17
16
15
14
13
12
6
CCS K13 K12 K11 K10
K00 K01 K02 K03 K04 K05 K06 K07
KEY input circuit
KEY output circuit
Timing generator
Data register
Frequency divider
Control circuit
Oscillation circuit
Output circuit
REM
VSS
10
9
8
5
455 KHz
ICT03
μPS1943G
LED driver
DT01
QT02
QT04

(Carrier: 37.97 KHz)

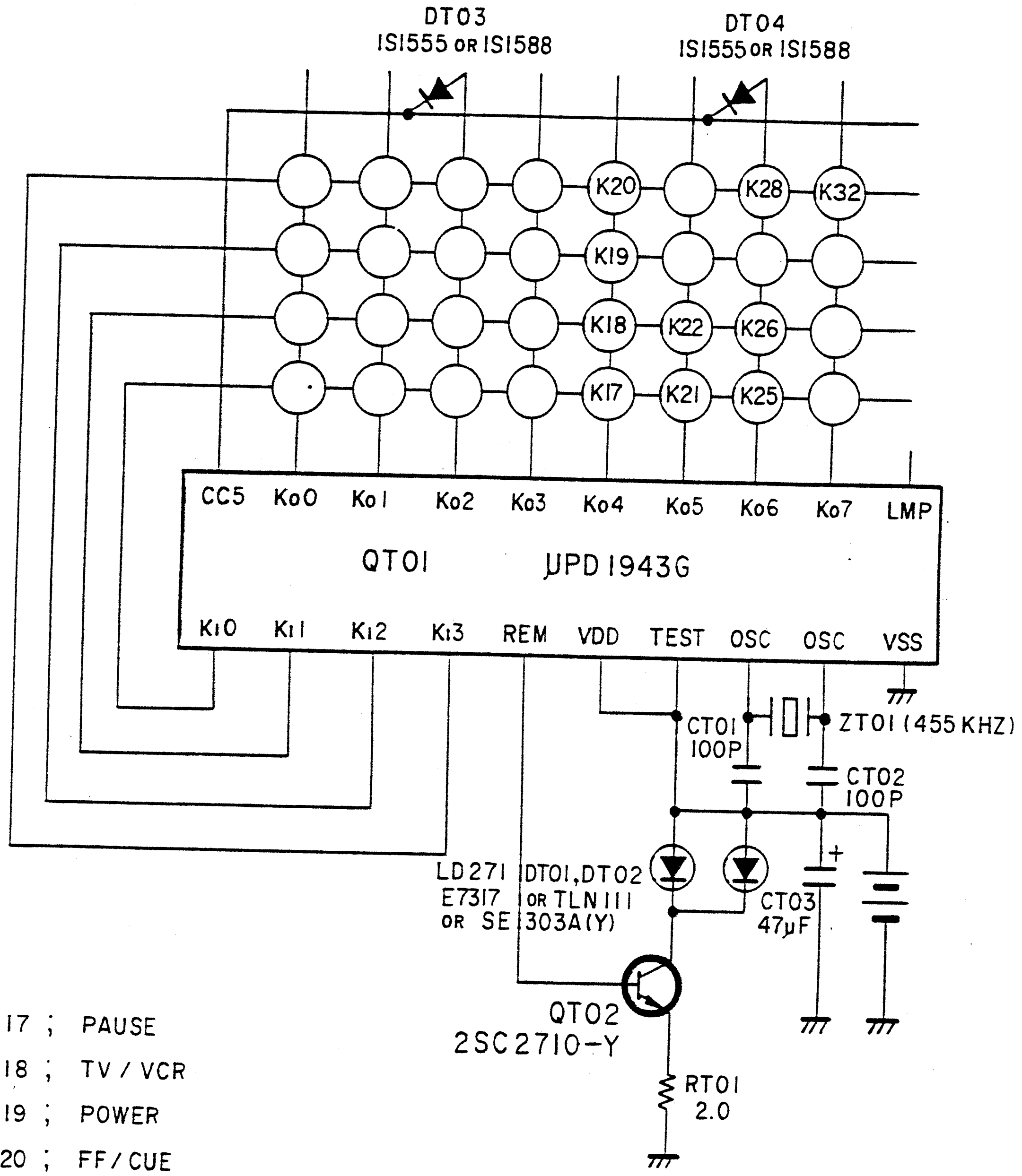
29. Remote Control Transmission Circuit


DT03
IS1555 OR IS1588
DT04
IS1555 OR IS1588
K20
K28
K32
K19
K18
K22
K26
K17
K21
K25
CC5
Ko0
Ko1
Ko2
Ko3
Ko4
Ko5
Ko6
Ko7
LMP
QT01
μPD1943G
Ki0
Ki1
Ki2
Ki3
REM
VDD
TEST
OSC
OSC
VSS
CT01
100P
ZT01 (455 KHZ)
CT02
100P
LD271
E7317
OR SE
DT01,DT02
OR TLN111
303A(Y)
CT03
47μF
QT02
2SC2710-Y
RT01
2.0

K17 ; PAUSE
K18 ; TV / VCR
K19 ; POWER
K20 ; FF / CUE
K21 ; STOP
K22 ; PLAY
K25 ; REC
K26 ; REW / REVIEW
K28 ; CH. UP
K32 ; CH. DOWN

30. Remo

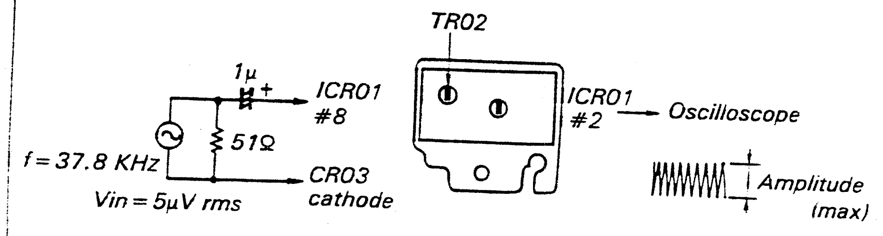
29. Remote Control Transmission Circuit


DT03
IS1555 OR IS1588
DT04
IS1555 OR IS1588
K20
K28
K32
K19
K18
K22
K26
K17
K21
K25
CC5
Ko0
Ko1
Ko2
Ko3
Ko4
Ko5
Ko6
Ko7
LMP
QT01
μPD1943G
Ki0
Ki1
Ki2
Ki3
REM
VDD
TEST
OSC
OSC
VSS
CT01
100P
ZT01 (455KHZ)
CT02
100P
LD271
E7317
OR SE
DT01,DT02
OR TLN111
303A(Y)
CT03
47μF
QT02
2SC2710-Y
RT01
2.0

K17 ; PAUSE
K18 ; TV / VCR
K19 ; POWER
K20 ; FF / CUE
K21 ; STOP
K22 ; PLAY
K25 ; REC
K26 ; REW / REVIEW
K28 ; CH. UP
K32 ; CH. DOWN

30. Remote Control Adjustment

V-M42 Wireless Remote Control Unit Adjustment Instructions

Adjustment item	Adjustment location	Measurement point	Measuring device	Value	Remarks
Infrared receiver IC sensitivity	TR02	ICR01 #2	Oscilloscope	Output level (max)	input level: 5μV-rms
Method	(Circuit to be measured)  ① Apply a 37.8 KHz, 5μV rms signal between ICR01 pin 8 and the cathode of CR03. ② Adjust TR02 so that the amplitude at ICR01 pin 2 becomes maximum.				

TR02
1μ
ICR01
#8
51Ω
f = 37.8 KHz
Vin = 5μV rms
CR03
cathode
ICR01
#2
Oscilloscope
Amplitude
(max)

SERVICE DATA
SUPPLEMENT
FILE NO. 033-102

センターファイル
CENTER FILE

TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-M41TL/42TL

SUMMARY

This Service Data covers only different parts from Service Data for Model V-M41/42 since V-M41TL/42TL are basically the same as Model V-M41/42.

The technical information included in Service Data for V-M41/42 can be used for V-M41TL/42TL servicing.

Technical information on V-M41/M42 is given in the following Service Data.

1. THEORY OF OPERATION (V-M41: File No. 030093-1, V-M42: 030094-1)
2. SERVICING DIAGRAMS (V-M41: File No. 030093-2, V-M42: 030094-2)
3. ADJUSTMENT PROCEDURE(V-M41/42 : File No. 030093-4)

C: CHANGE, A: ADDITION

DIFFERENT PARTS

LO NO	PART NO	DESCRIPTION	PART NO	DESCRIPTION	↓	REMARKS
A101	70812336	FRONT PANEL	70812357	FRONT PANEL	C	FOR V-M41TL only
A101	70812337	"	70812358	"	C	FOR V-M42TL only
A701	70913306	CARTON BOX	70913333	CARTON BOX	C	FOR V-M41TL only
A701	70913303	"	70913340	"	C	FOR V-M42TL only
F801	23144929	FUSE, 1.2A	23144907	FUSE, 1.0A	C	FOR V-M41TL/42TL
P801	70168070	POWER CORD	70168069	POWER CORD	C	"
S801			23145521	SWITCH	A	"
T802	23213801	TRANS,TPW1289	23213780	TRANS,TPW1302	C	"
Y101	70941423	Owner's MANUAL	70941441	OWNER'S MANUAL	C	FOR V-M41TL only
Y101	70941430	"	70941450	"	C	FOR V-M42TL only
Y104	70942367	CARD, QUICK REFERENCE	70942391	CARD, QUICK REFERENCE	C	FOR V-M41TL only
Y104	70942376	"	70942401	"	C	FOR V-M42TL only

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105, JAPAN

SERVICE DATA
FILE NO. 030-094-1

TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-M42/C

THEORY OF OPERATION
(V-M422,423,V-600C,AH-350)

Adjustment procedures are the same as those for the V-M41 chassis. For information on the adjustment procedures, refer to the manual for the V-M41 (FILE No. 030-093-4).

SPECIFICATIONS

GENERAL

Video recording system:	Rotary two-head helical scanning
Head configuration:	2-head rotary (HEAD: A, B)
Video signal:	EIA standard NTSC color
Storage temperature:	−20°C to +60°C (−4°F to +140°F)
Operating temperature:	5°C to 40°C (41°F to 104°F)
Antenna:	75-ohms external antenna terminal for VHF 300-ohms external antenna terminal for UHF
Channel coverage:	VHF channels 2−13 UHF channels 14−83 CATV channels A_2, A_1, A−I, J−W, AA−JJ
VHF output signal:	Channel 3 or 4 (selectable) 75-ohms unbalanced

SWITCH POSITION	CHANNEL
VL ch	2−6
VH ch	A_2, A_1, A−I, 7−13
U ch	14−83
CATV ch	J−W, AA−JJ

Power consumption	32W (8W with power off)
Weight:	7.7 kg
Dimensions:	420 × 105 × 382 mm (W × H × D)

VIDEO

Input:	VIDEO LINE IN: Pin jack-type connector 1,0V (p-p) 75-ohms unbalanced, sync. negative

VIDEO

Output:	VIDEO LINE OUT: Pin jack-type connector 1.0V (p-p) 75-ohms unbalanced, sync. negative
Signal to noise ratio:	Better than 45 dB

AUDIO

Input:	AUDIO LINE IN: Pin jack-type, 47k-ohms, −10 dBs
Output:	AUDIO LINE OUT: Pin jack-type, less than 10k-ohms, −7 dBs, unbalanced (load: more than 47k-ohms)
Frequency response:	[ßII]: 50 Hz to 8 KHz [ßIII]: 50 Hz to 7 KHz
Signal to noise ratio:	Better than 40 dB
Audio distortion:	Less than 4% at 400 Hz

TAPE TRANSPORT

Tape speed:	ßII 20 mm/sec., ßIII 13.3 mm/sec.
Maximum recording time:	300 min. with Toshiba L-830 tape (ßIII mode)
Fast forward time:	Within 4.5 min. (L-500)
Rewind time:	Within 4.5 min. (L-500)

TIMER

Fluorescent digital display
Count down from AC line frequency.

Remote Control Unit

11 key: 15 modes. Infrared Remote Control Operation

Design and specifications are subject to change without notice.

Caution: The unauthorized recording of television programmes and other materials may infringe on the rights of others.

SAFETY NOTICE

SAFETY PRECAUTIONS

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 ohms per volt or more sensitivity.

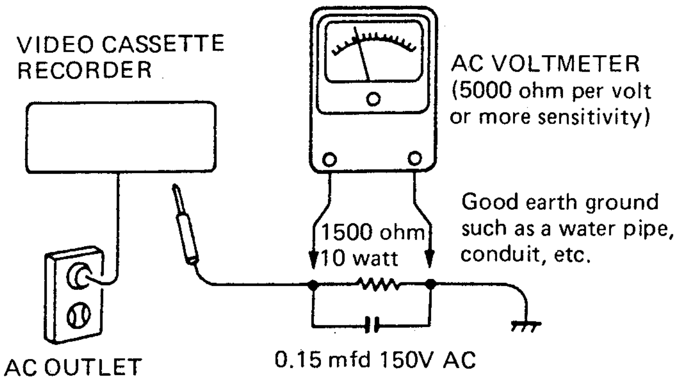
Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet, screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500 ohm resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 volts. A reading exceeding 0.3 volts indicates that a dangerous potential exists, the fault must be located and corrected.

Repeat the above test with the VCR power plug reversed.

NEVER RETURN A VCR TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.

READING SHOULD NOT EXCEED 0.3V

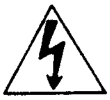

VIDEO CASSETTE RECORDER
AC VOLTMETER (5000 ohm per volt or more sensitivity)
Good earth ground such as a water pipe, conduit, etc.
1500 ohm
10 watt
AC OUTLET
0.15 mfd 150V AC

Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check

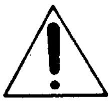
CAUTION

RISK OF ELECTRIC SHOCKS
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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- (2) SET YOUR TELEVISION TO THE VCR CHANNEL 2
- (3) IDENTIFICATION OF CONTROLS 3
- (4) SETTING THE PRESENT TIME 5
- (5) CHANNEL SELECTION 6
- (6) RECORDING A TV PROGRAM 7
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- (8) OTHER PLAYBACK MODES 9
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- (11) ONE TOUCH TIMER RECORDING 13
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- (13) CAMERA RECORDING 16

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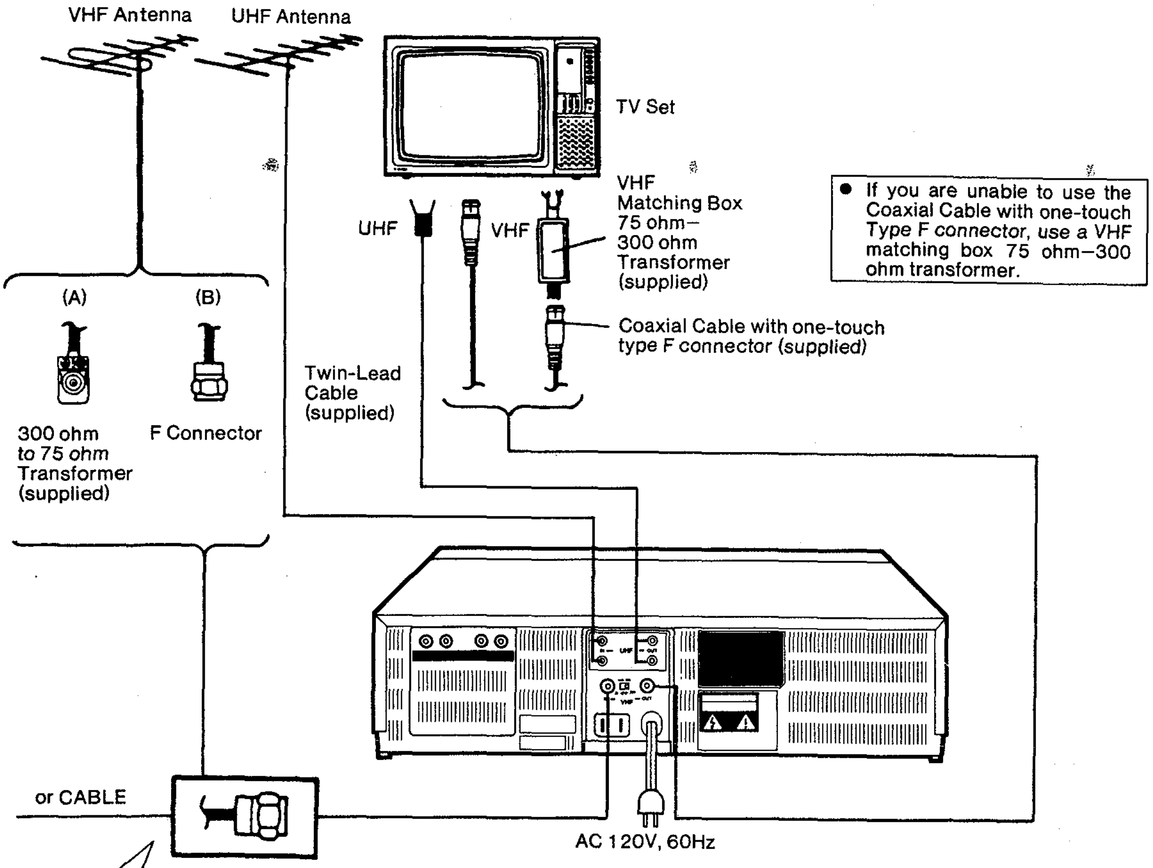
NOTE:
The servo, video, and audio circuits are the same as those of the V-M41. Therefore, they are not described here.

ANTENNA CONNECTION

1. Remove the Antenna Cable from the TV set. Connect it to the "VHF IN", "UHF IN" Terminal of the VCR.
2. Connect one end of the Antenna Cable and Twin-lead cable to the "VHF OUT", "UHF OUT" Terminal of the VCR.
3. Connect the other end to the "VHF", "UHF" Terminal of the TV.


VHF Antenna
UHF Antenna
TV Set
UHF
VHF
VHF Matching Box 75 ohm–300 ohm Transformer (supplied)
Coaxial Cable with one-touch type F connector (supplied)
Twin-Lead Cable (supplied)
(A)
(B)
300 ohm to 75 ohm Transformer (supplied)
F Connector
or CABLE
AC 120V, 60Hz

- If you are unable to use the Coaxial Cable with one-touch Type F connector, use a VHF matching box 75 ohm–300 ohm transformer.

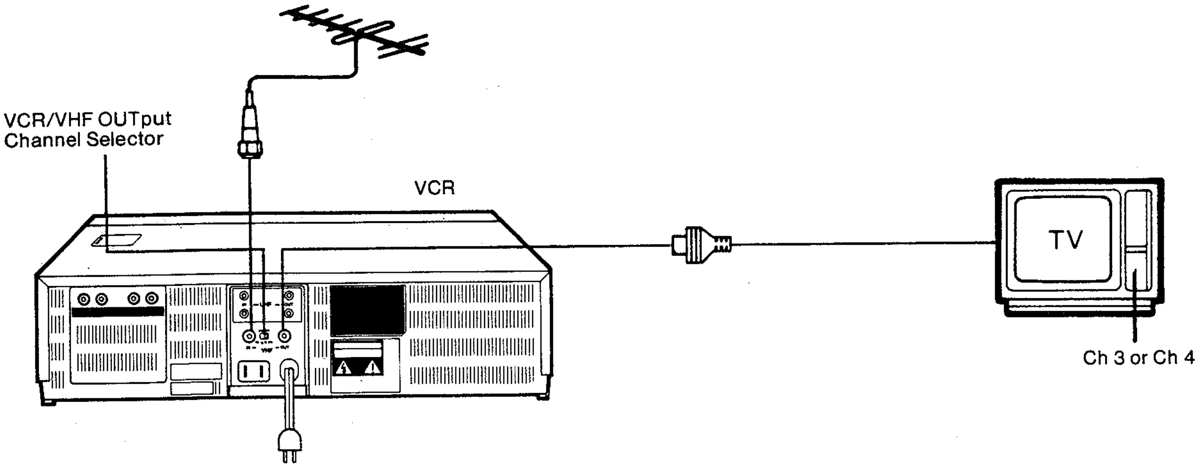
- The unit is designed to tune the Mid-Band and Super-Band frequencies used by many cable sections.

NOTE TO CATV SYSTEM INSTALLER:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

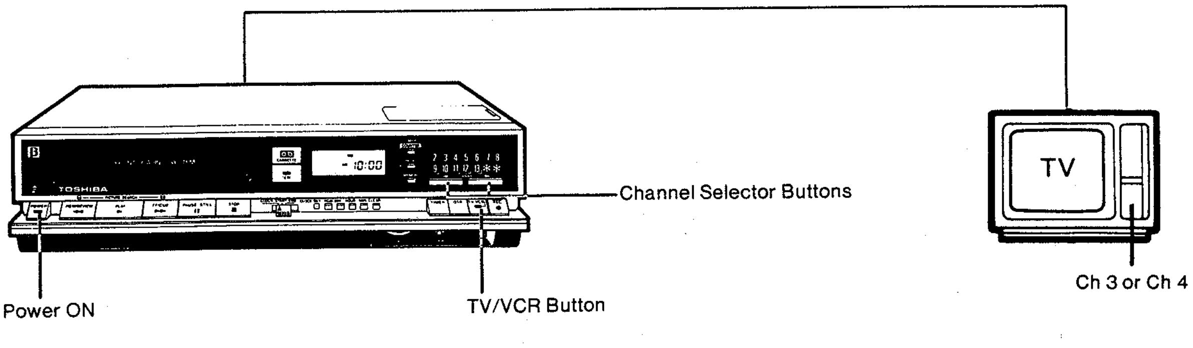
In the above configuration, you can record programs from CATV channels as well as VHF channels 2 through 13. You can record programs from 117 CATV channels except scrambled channels.

SET YOUR TELEVISION TO THE VCR CHANNEL

1. Set your TV to channel 3 unless channel 3 is one of the TV stations in your area. If channel 3 is used in your area, set your TV to channel 4 and slide the VCR/VHF OUTput Channel Selector toward channel 4. The VCR/VHF OUTput Channel Selector is located on the rear panel at left side of the antenna connector. This is the VCR channel on your television set. Your television receiver must be tuned to this channel any time a video cassette is played back on the VCR.



2. Plug the VCR power cord into a 120V electrical outlet and press the "**POWER**" button. The "**POWER**" lamp will light. The clock will flash repeatedly. This is not a malfunction
3. Press the "**TV/VCR**" button. The VCR lamp will light. Select an active TV channel by pushing the VCR Channel Selector Buttons. The picture from that channel should now be displayed on your television.



NORMAL TV VIEWING

1. Turn ON your TV receiver. There is no need to turn the POWER switch of VCR ON.
2. Tune your TV receiver to the channel you want to watch.

* The TV/VCR button should be set to TV position (The VCR Indicator lamp goes OFF.) if the POWER button is turned ON.

IDENTIFICATION OF CONTROLS

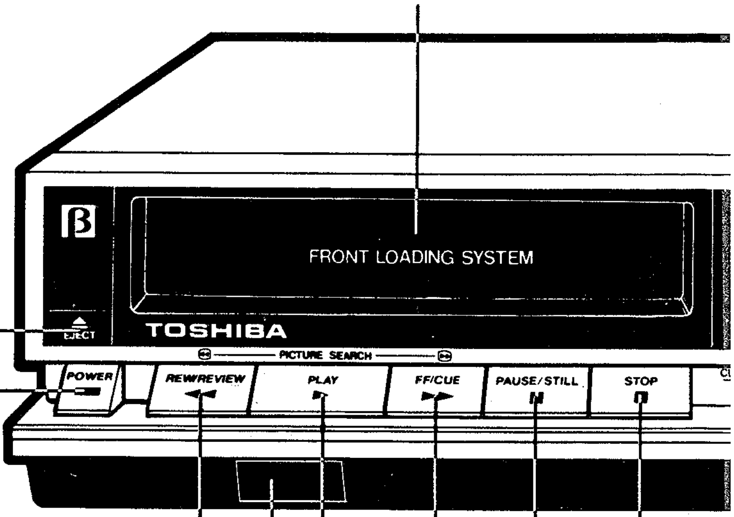
(FRONT)

TIMER/COUNTER Button
Used to change the clock display and the counter display.

TIMER/COUNTER Display

Cassette Compartment

CASSETTI


ꞵ
FRONT LOADING SYSTEM
EJECT
TOSHIBA
PICTURE SEARCH
POWER
REW/REVIEW
PLAY
FF/CUE
PAUSE/STILL
STOP

EJECT Button

POWER Button

REW/REVIEW Button
(REVERSE PICTURE SEARCH)

Infrared Remote Control Receiver

PLAY Button

FF/CUE Button
(FORWARD PICTURE SEARCH)

PAUSE/STILL Button

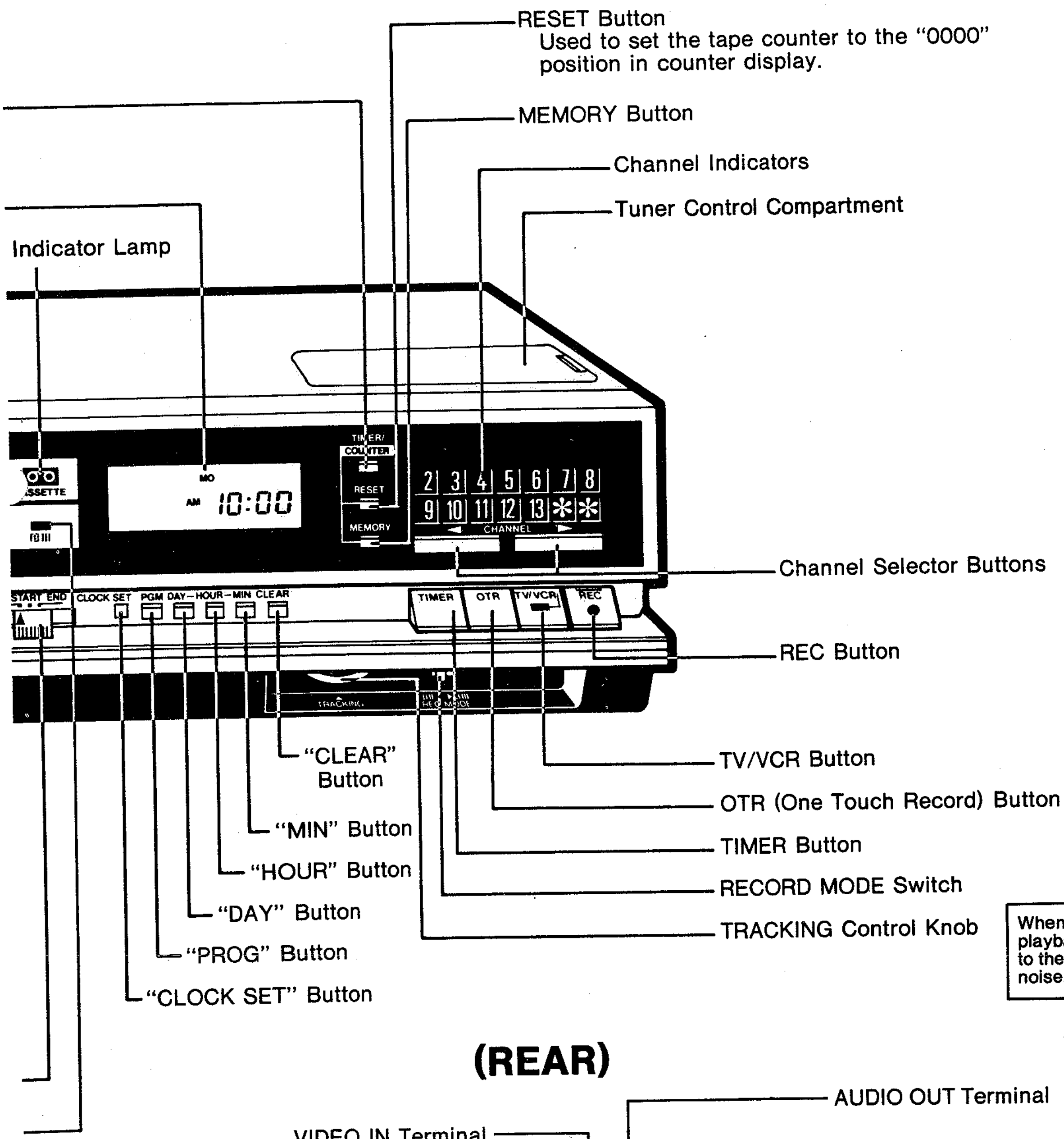
STOP Button

TIMER SELECTOR (CLOCK, START, END) Switch

ꞵIII Indicator
Indicates ꞵIII in REC and PLAY modes.

CAUTION

Never operate the machine right after having transported it from a cold location directly to a warm location.
Wait for about an hour and a half to two hours.
This is because, in such a case, moisture may condense on the head cylinder inside the machine.
The tape will tend to stick to the head cylinder and will be damaged.



TIMER/COUNTER
RESET
MEMORY
MO
AM 10:00
2 3 4 5 6 7 8
9 10 11 12 13 * *
◄ CHANNEL ►
START END
CLOCK SET PGM DAY–HOUR–MIN CLEAR
TIMER
OTR
TV/VCR
REC
TRACKING
REC MODE

RESET Button
Used to set the tape counter to the "0000" position in counter display.

MEMORY Button

Channel Indicators

Tuner Control Compartment

Indicator Lamp

Channel Selector Buttons

REC Button

TV/VCR Button

OTR (One Touch Record) Button

TIMER Button

RECORD MODE Switch

TRACKING Control Knob

When noise stripes occur on the playback picture, turn this knob to the right or left to minimize the noise.

"CLEAR" Button

"MIN" Button

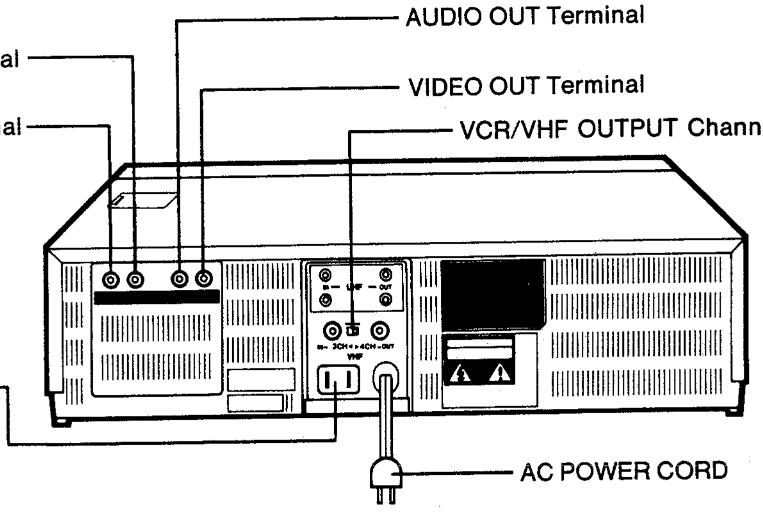
"HOUR" Button

"DAY" Button

"PROG" Button

"CLOCK SET" Button

(REAR)



IN — UHF — OUT
3CH ◄ ► 4CH
VHF

AUDIO OUT Terminal

VIDEO IN Terminal

VIDEO OUT Terminal

AUDIO IN Terminal

VCR/VHF OUTPUT Channel Selector

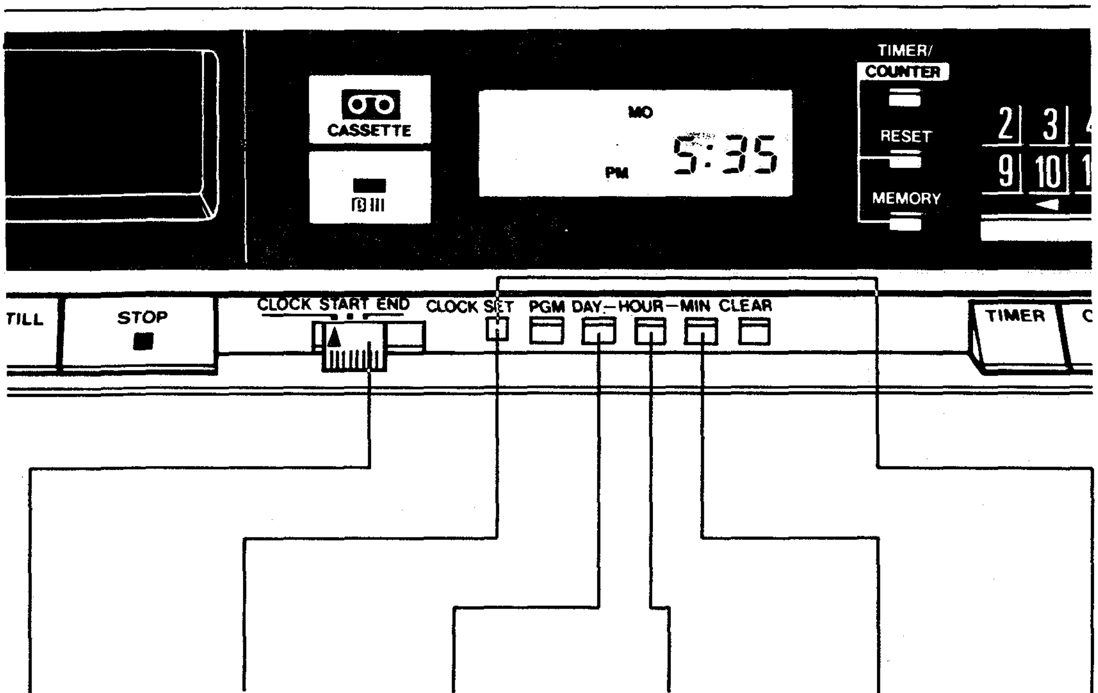
AC Supply Outlet
This terminal supplies AC power (120V AC 60Hz 400W MAX.). Power is supplied regardless of the power switch on or off.

AC POWER CORD

SETTING THE PRESENT TIME

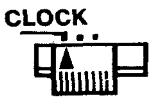
This clock provides a 12-hour display. The time display brightness will automatically darken from 10 PM to 6 AM.

Example: Monday, 5:35 PM


CASSETTE
MO
PM 5:35
TIMER/
COUNTER
RESET
MEMORY
TILL
STOP
CLOCK START END
CLOCK SET
PGM
DAY—HOUR—MIN
CLEAR
TIMER

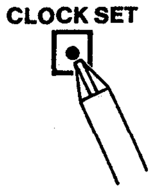
1

Set the Timer Selector switch to "CLOCK".



2

Press the CLOCK SET button.



Use the band selection tool provided.

3

Set the Day of the week. "MO"

4

Set the Hour. "PM 5".

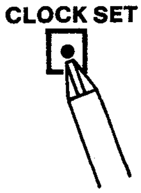
5

Set the Minute, "35"

6

Press CLOCK SET button while listening to the time tone.

The clock operation will start at 5:35 PM.



When a power interruption occurs:

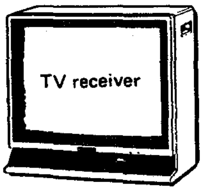
After about 10 minutes of power interruption, the clock display will flash. Reset the video timer again after setting the clock.

CHANNEL SELECTION

This video recorder has been preadjusted for VHF channels 2 through 13. To receive other VHF and UHF channels, or when rearranging the channel order, reset them as follows.

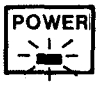
1

Turn the TV power on and set the VCR channel (Channel 3 or 4).


TV receiver

2

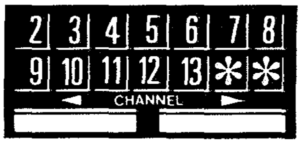
Turn the VCR power on.



Press the TV/VCR button to VCR.

3

Select the channel to be adjusted by pushing channel button.

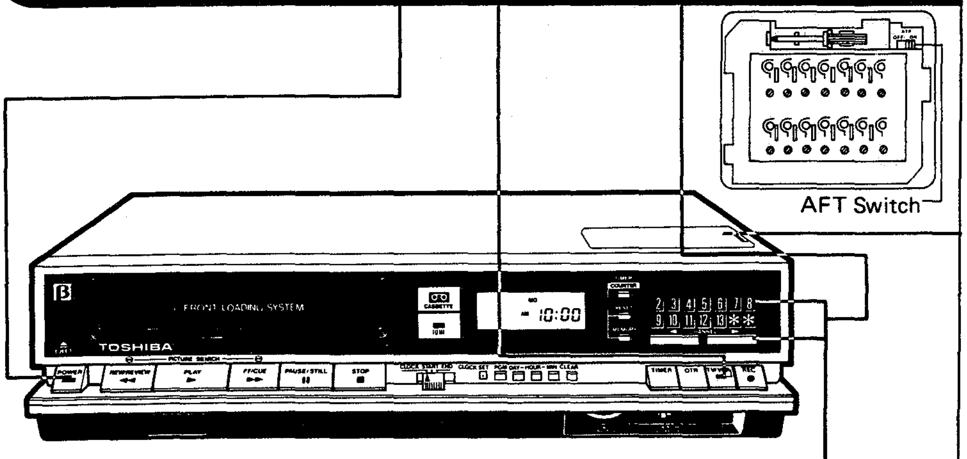

2
3
4
5
6
7
8
9
10
11
12
13
*
*
CHANNEL

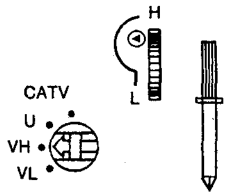
4

① Open the cover and set AFT switch to "OFF".

② Select the channel range with the attached band selection screwdriver.

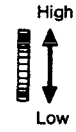
V_L	CH	2-6
V_H	CH	A2, A1, A to I, 7-13
U	CH	14-83
CATV	CH	J-W, AA to JJ


AFT Switch
TOSHIBA
FRONT LOADING SYSTEM


H
L
CATV
U
VH
VL

③ Turn the tuning knob so that the desired channel has excellent picture and sound.

Larger numbered channels are found by rotating the knob to High. Smaller numbered channels rotated to Low.

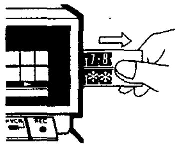


5

- Next, reset the other channel buttons by repeating 3 and 4.
- Turn the AFT switch "ON" and close the cover.

Replace the labels to match the new channel order.

① Pull the number plate out.



② Remove the number labels and cut off the label.

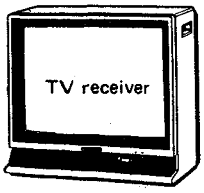
③ Select a channel number tag and place it on the number plate.

④ Replace the number plate.

RECORDING A TV PROGRAM

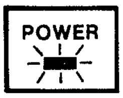
1

Turn the TV power on and set the VCR channel. (Channel 3 or 4)



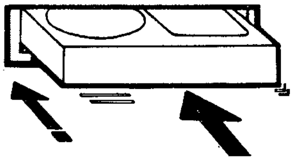
2

Turn the VCR power on.

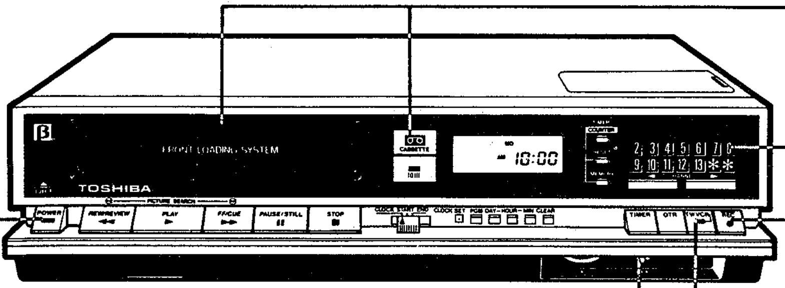


3

Insert a video cassette. The cassette indicator lamp flashes until the cassette is installed properly.



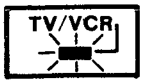
Confirm that the cassette tab is not broken.



Notes:
1. Any AUDIO or VIDEO INput should be disconnected from the terminals.
2. To change a channel during recording, press the PAUSE/STILL button, select the desired new channel then press the PAUSE/STILL button to continue the recording.

4

Press the TV/VCR button to VCR.

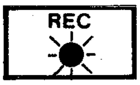


5

Press the Channel Selector buttons to desired channel. At this time, set the Record Mode switch to βII or βIII

6

Press the REC button.



• Press the PAUSE/STILL button to eliminate unnecessary material.

Although the program continues on the TV screen, the tape is stopped and video recording is not performed. To resume video recording, press the PAUSE/STILL button again. Unnecessary material can be eliminated with this procedure.

Note: If pause is continued for about 10 minutes, the recorder returns to the stop mode in order to protect the tape and internal video recorder components.

• Viewing another program while recording.

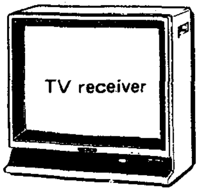
If two desired programs are on at the same time, one program can be viewed while the other is being recorded.

1. Start recording one program by following procedures 1 to 6 above.
2. Press the TV/VCR button to TV. (Lamp goes off.)
3. Select the desired TV channel for viewing by using the TV channel selector of your TV receiver.

PLAYBACK

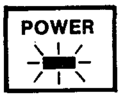
1

Turn the TV power on and set the VCR channel. (Channel 3 or 4.)



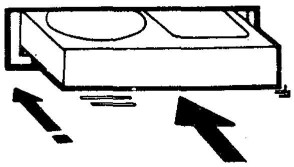
2

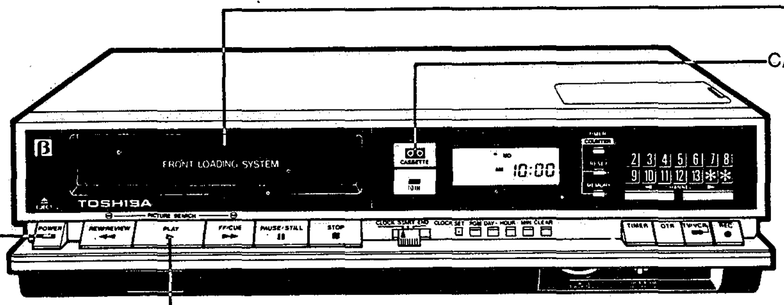
Turn the VCR power on.



3

Insert a video cassette correctly.

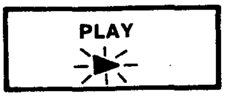




CASSETTE Indicator Lamp

4

Press the PLAY button.
The playback picture appears on the TV after about 2 or 3 seconds.
At this time, TV/VCR button is automatically switched to VCR.



- **To stop playback:**
  Press the STOP button.
  Next, press the EJECT button to remove the video cassette. The cassette indicator lamp flashes until the video cassette comes out.
- **Tape speed**
  Video cassettes recorded by βII and βIII tape speeds can be viewed with this VCR. The tape speed is automatically set during playback.
- **Auto Rewind**
  When a video cassette tape ends during playback and recording (except timer recording), the auto rewind automatically rewinds the tape.

OTHER PLAYBACK MODES

1. Slow Playback

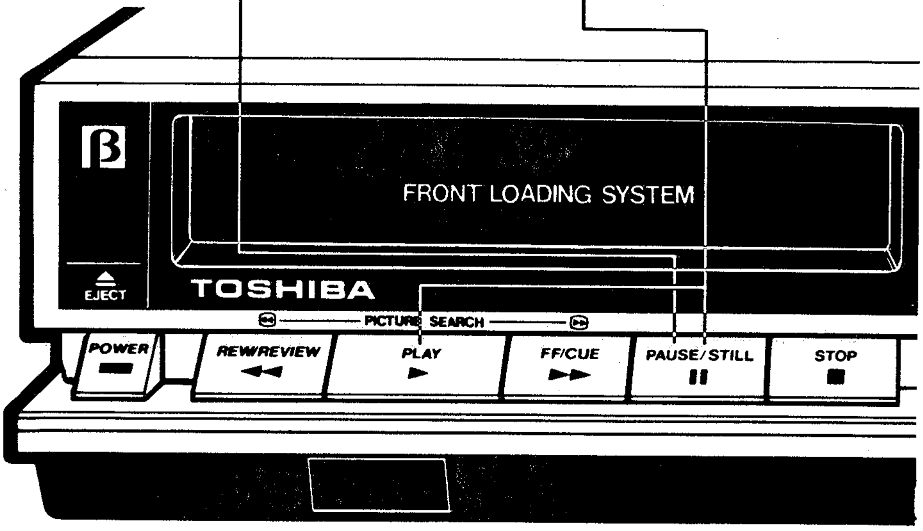
1. Press the PLAY button.
2. Press the PAUSE/STILL button.
3. Slow playback at 1/8 the speed of standard playback can be viewed while the PLAY button is pressed.
   For frame by frame operation, press and release PLAY button to advance the picture one frame at a time.
4. Press the PAUSE/STILL button to return to normal playback.

2. Still picture playback

To freeze the picture, press the PAUSE/STILL button during PLAY mode.

Notes

1. The sound is muted and picture noise may occasionally occur during still/slow picture playback. This does not indicate a malfunction.
2. Still/slow picture returns to normal playback after about 5 minutes to protect the tape.
3. A distorted picture occurs during still/slow picture of a βII mode recording.



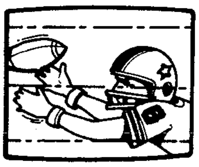
3. Picture Search

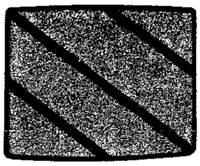
Review or Cue allow playback at about 8 times the normal speed, and repeated rewind or fast forward can be performed with quick search. It is very convenient during search for a particular section on the tape.

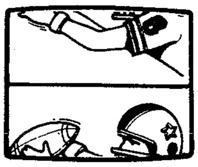
① Press the PLAY button.	② Press the REW/REVIEW (FF/CUE) button.	③ Press the REW/REVIEW (FF/CUE) button.	④ Press the PLAY button.
Normal playback appear.	Rewind playback (fast forward playback) at about 8 times normal speed	Rewind (fast forward)	Standard playback

Note: Review playback (cue playback) and rewind (fast forward) are alternately selected by repeating (2) and (3).

- Several static horizontal noise lines will appear during picture search. The sound is muted.
- When the picture is shifted horizontally during picture search, adjust the TV horizontal control knob.
- When the picture shifts vertically during picture search, adjust the TV vertical control knob.





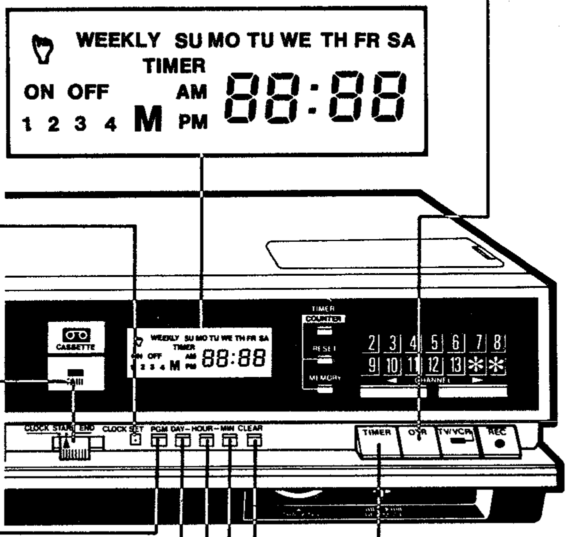


Note: During Picture Search operation, βII mode pictures will be distorted.

PROGRAMMABLE TIMER

- The timer can be preset to record up to four programs on one specific day of the week or at the same time every day, or at different times on different days of the week.
- If power to the VCR is interrupted, the clock will continue to run and the programmed instructions will be retained for about 10 minutes.
  After 10 minutes of power interruption, if the clock flashes SU AM 12 : 00, the clock and program contents will have to be reset.

- The clock used is of the 12-hour type.



CLOCK SET button

- Used to set the present time.
- When this button is pressed once, the unit enters clock set mode. When the button is pressed again, clock set mode is released.

OTR Button

- Used to carry out recording in units of 30 minutes in normal mode.
  * Current time → 30 min → 60 min →
- Used to specify the timer on time in units of 30 minutes.
  30 → 60 → 90 → 120 → 150 →

Timer Selector Switch

- CLOCK mode
  For the present time display.
- START mode
  For checking and setting the timer on time.
- END mode
  For checking and setting the timer on and off time.

PGM Button

- Used to specify the program number 1–4.

Timer Button

DAY Button

- Used to set the day of the week.
- When the button is pressed once, the day of the week advances by one. When the button is kept depressed, the days advance rapidly.

<Example>
One day of the week; "SU"
Same day of every week; "WEEKLY SU"
Everyday; "SU. MO. TU... SA"

CLEAR Button

- Used to cancel the preset program.

MIN Button

- Used to set the minute digits.
- When the button is pressed once, the digit advances by 1.
  When the button is kept depressed, the digits advance rapidly.

00 → 01 → 02 → 03 → 59

HOUR Button

- Used to set the hours.
- When the button is pressed once, the digit advances by 1.
  When the button is kept depressed, the digits advance rapidly.

SETTING THE PROGRAMMABLE TIMER

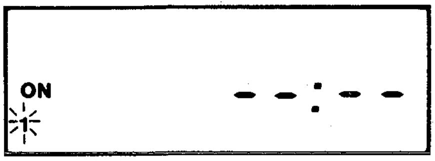
- Confirm the present time. If the present time is not correct, set it again.
- Press the POWER button on.
- Insert the cassette (Check that the cassette tab has not been removed.)
- Preset desired programs as follows.
- When setting the programmable timer, be careful not to overlap recording time zone.
- Display when four programs are overlapped.

1 Set the Timer Selector switch to START.
2 Specify the program number 1—with the "PGM" button.
3 Select the program you want to see with the Channel Selector buttons.
4 Set the day of the week, the hour and minutes of recording on time (SU → MO → - - - - → SA → WEEKLY SU → WEEKLY MO → - - - - → WEEKLY SA → SU. MO TU. . . SA. SU → - - - -) with "DAY", "HOUR " and "MIN" buttons.
5 Set the Timer Selector switch to END.
6 Set the end time with "HOUR" and "MIN" buttons.
7 To preset more programs repeat steps 1 – 6 . (Max. 4 programs).
8 Return the Timer Selector switch to CLOCK.
9 Press the TIMER button.

Timer recording

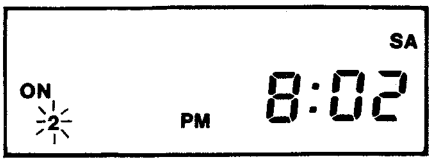
Example: To set channel 6 on Saturday from PM 8:02 to PM 9:45 as program 2. (Present day/time, Tuesday, AM 8:21.)

(1) Set the Timer Selector switch to START.

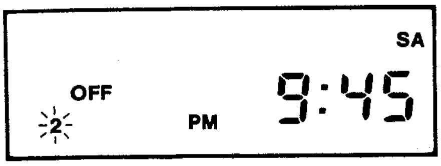


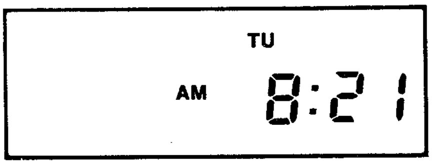
(When timer is not set to program 1)

(2) Set the program number .... "2"
(3) Set the recording channel .... "6"
(4) Set the day of the week .... "SA"
(5) Set the timer on hour .... "PM 8"
(6) Set the timer on minute .... "02"

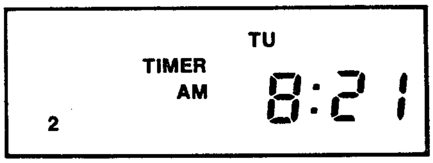


(7) Set the Timer Selector switch to END.
(8) Set the timer off hour .... "PM 9"
(9) Set the timer off minute .... "45"





(10)Set the Timer Selector switch to CLOCK.
The display returns to the present time display and the program number* goes off.



Note: Timer advances during setting.

Press the TIMER button to end the timer setting.

TIMER is displayed and the power indicator goes off.

Notes:

1. When no cassette is loaded or the tab of the cassette has been removed, timer recording is not possible. In this condition, Error is displayed at the first digit of the timer when the TIMER button is pressed.
2. During timer recording, the preset contents (program number, channel, day of the week of timer on/off time) cannot be changed.

To check the timer setting

(1) Set the Timer Selector switch to START.
(2) Press the "PGM" button to display the program number to be checked .... "2"
The display shows the preset timer on time and channel .... "PM 8:02" and "6"
(3) Set the Timer Selector switch to END.
The display shows the preset timer off time .... "PM 9:45"
(4) Set the Timer Selector switch to CLOCK.

Note:
When the Timer Selector switch is set to START or END, the channel indicator lights.

To change or cancel the timer setting

(1) Set the Timer Selector switch to START.
(2) Press the "PGM" button to display the program number to be changed or cancelled.
(3) Press the "CLEAR" button. The timer on/off time and channel are erased.

Note:

- The timer setting can be cancelled only when the Timer Selector switch is set to START.

ONE TOUCH TIMER RECORDING

The One Touch timer recording function permits unattended recording for a maximum of five hours. Also, each time the OTR button is pressed during normal mode the recording time is extended 30 minutes. When setting the time, timer off time can be set in 30 minute increments after setting the timer off time.

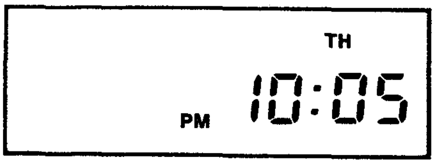
Notes: 1. Thirty minutes are added every time the OTR button is pressed for up to five hours (seven times). The one touch time can only be set in 30-minute units. When the OTR button is pressed several times, or the OTR button is switched to the timer button, press the TIMER button within nine seconds.

2. One touch timer operation is possible only when power is supplied and the Timer Selector switch is set to CLOCK.

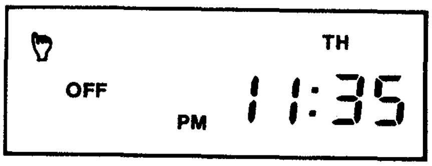
Example: To record channel 4 starting from now for 1-1/2 hours. (Present day/time, Thursday, PM 10:05)

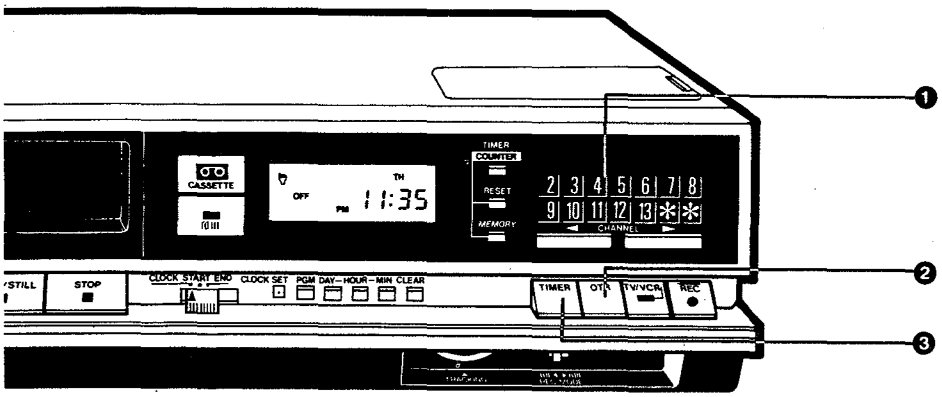
(1) Select channel 4 by pressing channel selector button.
(2) Press the OTR button to set the recording time.
When the button is pressed once: PM 10:35 (30 minutes)
When the button is pressed twice: PM 11:05 (1 hour)
When the button is pressed three times: PM 11:35 (1 hour 30 minutes)
(3) Press the TIMER button within 9 seconds.

Present time

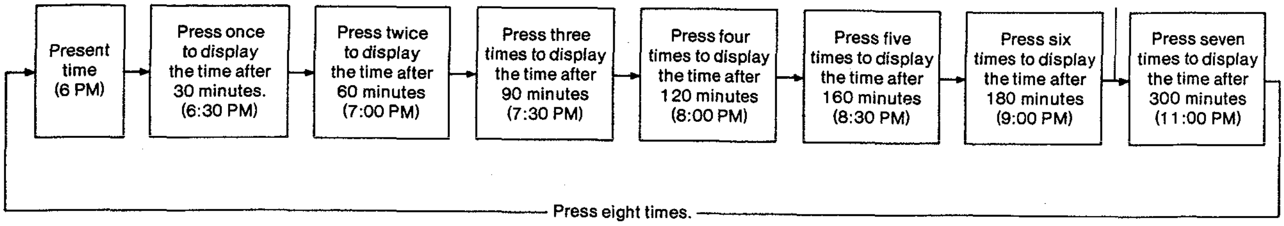


Timer off time


TH
OFF
PM
11:35


❶
❷
❸
CASSETTE
OFF
PM
TH
11:35
TIMER
COUNTER
RESET
MEMORY
2 3 4 5 6 7 8
9 10 11 12 13 * *
CHANNEL
STILL
STOP
CLOCK START END
CLOCK SET
PGM
DAY–HOUR–MIN
CLEAR
TIMER
OTR
TV/VCR
REC

Note:
Display of the timer advances 2 hours by giving the 7th press.


Present time (6 PM)
Press once to display the time after 30 minutes. (6:30 PM)
Press twice to display the time after 60 minutes (7:00 PM)
Press three times to display the time after 90 minutes (7:30 PM)
Press four times to display the time after 120 minutes (8:00 PM)
Press five times to display the time after 160 minutes (8:30 PM)
Press six times to display the time after 180 minutes (9:00 PM)
Press seven times to display the time after 300 minutes (11:00 PM)
Press eight times.

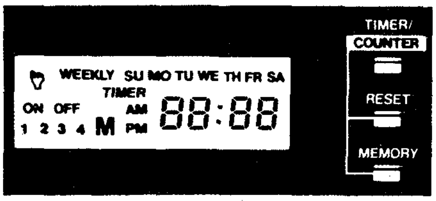
Example: To set channel 6 starting from Saturday, PM 8:02 for 1 hour as program 1. (Present day/time, Tuesday, AM 8:21)

(1) For the program, channel and timer on time setting, refer to steps (1)–(6) of "Timer recording".
(2) Set the Timer Selector switch to END.
(3) Press the OTR button twice.
(4) Set the Timer Selector switch to CLOCK.
(5) Press the TIMER button to complete the timer setting.
"TIMER" indicator lights.

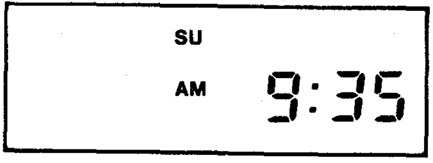
Note:
When the OTR button is pressed once, the time increases by 30 minutes.
30 min → 60 min → 90 min → 120 min → 150 min → 180 min . . . →

Error indication
When the TIMER button is pressed without setting the timer on/off time, or a cassette whose safety tab has been removed is loaded, the "E" indicator lights (when the TIMER button is pressed).

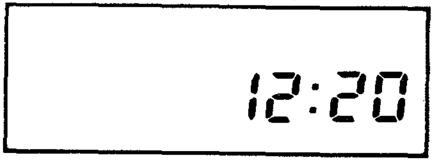
TIMER/COUNTER display: The indication of TIMER/COUNTER display can be changed with TIMER/COUNTER button.



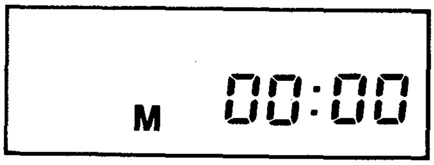
Timer Display



Counter Display



MEMORY function: When the MEMORY button is pressed, the "M" indicator is displayed and the tape stops at the set counter reading between 0000–9997 during rewinding. (This does not function in picture search or fast forward mode.)

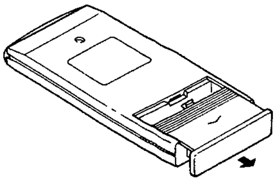


Note:
The counter operates even when it functions as a clock.

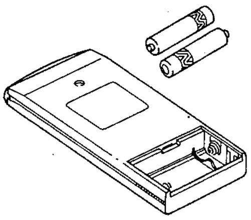
REMOTE CONTROL OPERATION

INSTALLING BATTERIES

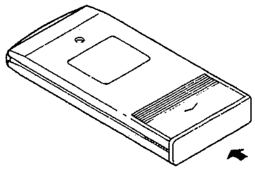
How to install batteries in the Remote Control Unit



Remove the battery cover on the reverse side of the unit.



Install 2 batteries ("AA" size) into the unit.
Note: Carefully install batteries to match the polarity diagrams.

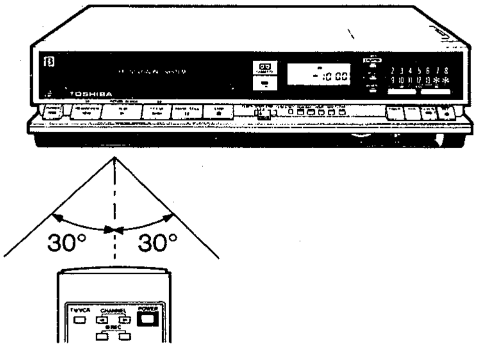


Close the battery cover.

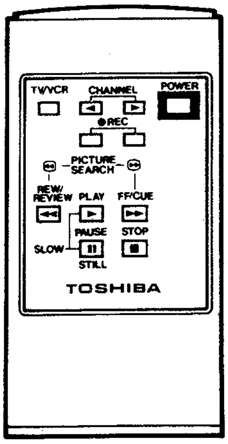
REMOTE CONTROL OPERATION RANGE

The Remote Control must have a clear line of sight to the sensor on the front of the VCR. It must be within an angle of 30° either side of center. The maximum operating distance is about 23 feet.

Point the front end of the Remote Control at the VCR.



REMOTE CONTROL BUTTON FUNCTIONS



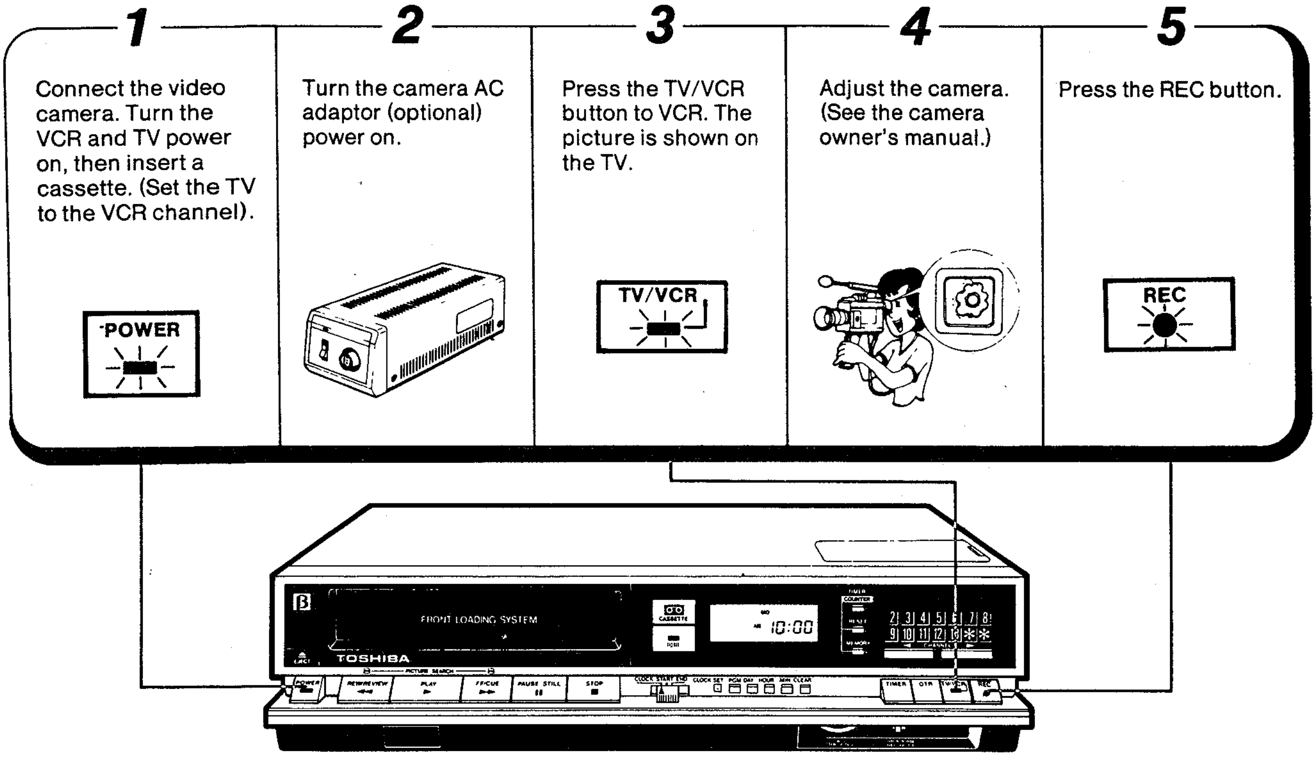
The remote control unit allows remote operation of 15 modes:
PLAYback, STILL picture, SLOW playback, Frame advance, CUE, REVIEW, Fast Forward, Rewind, PAUSE, STOP, TV/VCR, CHANNEL up, CHANNEL down, REC, and POWER ON/OFF.

Notes:

1. Remote control cannot be operated in the following conditions:
   1) In timer recording mode
   2) Without a cassette in the cassette compartment
   However, TV/VCR, CHANNEL, and POWER modes can be operated by remote control.
2. When using remote control unit, press control buttons at intervals of about one second to ensure correct operation.
3. During PAUSE/STILL mode a few noise bars will appear. If the noise bars appear in the middle of the screen, press the PLAY button until the noise bars appear at the top or bottom of the screen and give the best picture.
4. If the remote control unit is not to be used for a long period of time, remove the batteries to avoid possible damage from battery corrosion.
5. Keep unit away from extremely hot or humid places and avoid mechanical shock.

CAMERA RECORDING

Camera recording can be easily performed indoors by following this simple procedure.

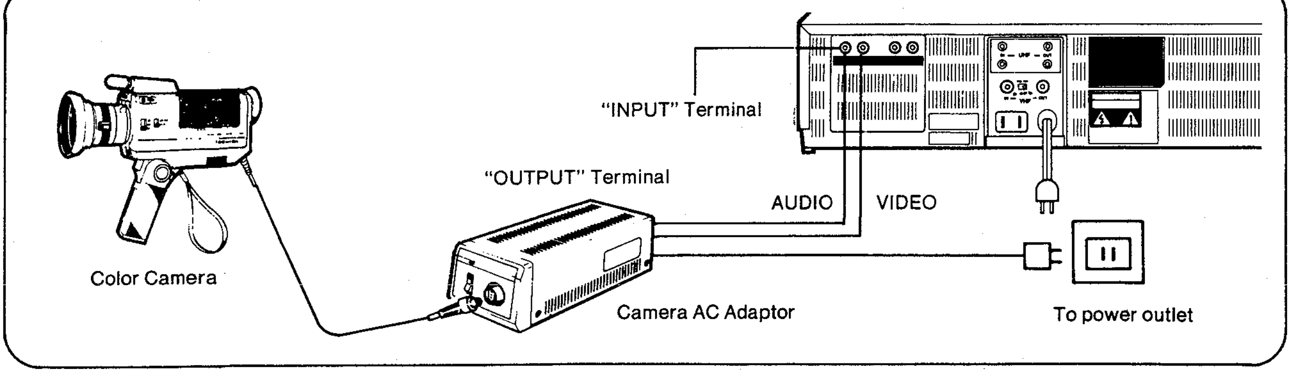


1. Connect the video camera. Turn the VCR and TV power on, then insert a cassette. (Set the TV to the VCR channel).
2. Turn the camera AC adaptor (optional) power on.
3. Press the TV/VCR button to VCR. The picture is shown on the TV.
4. Adjust the camera. (See the camera owner's manual.)
5. Press the REC button.

·POWER
TV/VCR
REC
TOSHIBA
FRONT LOADING SYSTEM
10:00

- **To stop recording:**
  Press the STOP button.
  Press the EJECT button to remove the cassette.
- **To stop recording temporarily during video recording:**
  Press the PAUSE/STILL button.
  Press it again, then recording starts again. If pause continues for about 10 minutes, the VCR stops to protect the cassette tape and internal video recordig components.
- **When a "beep" sounds during recording:**
  This occurs because the camera's built-in microphone is too close to the TV speaker. Move the camera away from the TV or reduce the T.V speaker volume.

Camera Connection



"INPUT" Terminal
"OUTPUT" Terminal
AUDIO
VIDEO
Color Camera
Camera AC Adaptor
To power outlet

1-2 Power Supply Circuits

(1) Outline

The power supply circuit consists of the AC circuit, power transformer, four rectification circuits, and voltage regulator circuits that follow the rectification circuits.

Of the main power supply systems, the first power line system supplies +13.2 V and +12 V; the second power line system supplies +6.5 V and, in three different ways, +5 V (IC 5 V, timer 5 V, and backup 5 V); and the third power line system provides +32 V and −28 V to the loads.

Furthermore, the first line system provides the heater power of approximately +20 V.

The tertiary winding of the power transformer also supplies AC 3.1 V to the filament of the timer display tube.

(2) Differences from V-M41

The first and the third power line systems are the same as those in the V-M41. This section will concentrate on the +5 V voltage regulator circuit, which is the main difference from the V-M41.

The AC voltage supplied from the center tap of the power transformer (pin ③ of P803) is full-wave rectified by diodes D802 and D803 in the +5 V line system rectification circuit, and converted to approximately DC 10 V. This DC voltage is supplied to the +6.5 V, IC 5 V, timer 5 V, and backup 5 V regulator circuits.

The IC 5 V line, which is voltage regulated by Q809 and D813, is mainly connected to the logic and servo circuits.

The timer 5 V and backup 5 V lines are voltage regulated by Q810, D813, and D812. To provide backup, capacitors are connected to these 5 V lines and charged through D816 for the timer 5 V line and through D817 for the backup 5 V line.

When the power cord plug is connected to an AC outlet, the IC 5 V, timer 5 V, and backup 5 V lines are always active, regardless of whether the power switch is turned on and off.

1-3 ANT Input/Output and Receiver Circuits

(1) Outline

The receiver circuit consists of the antenna input/output circuit, channel selector circuit, and PIF/SIF circuit. The receiver circuit operate to select a desired signal from the telecast TV signals picked up by the antenna, and to process the channel signal to obtain stable video and audio signals. These signals are sent to the video and audio circuits.

The output signal from the video and audio circuits are modulated into channel 3 or 4 as a regular off-air signal so that it can be directly monitored by conventional TV receivers.

(2) Differences from V-M41

The difference between the V-M42 and the V-M41 is the number of the channel selction positions. The V-M41 has 12 positions but the V-M42 has 14 positions. The channel selector circuit has been modified to provide the two additional positions.

1-4 Timer, Channel Selector, and Electronic Counter Circuits

(1) Outline

The timer, channel selector, and electronic counter circuits consist of a fluorescent display tube, which displays either the time or acts as an electronic counter, an operation key matrix circuit, and a microcomputer (TCP4633-9822X) which performs major functions. The functions of these circuits are to set the timer setting, select channels, count tape travel, etc.

(2) Differences from V-M41

The TCP4633-9814X timer microcomputer has been replaced with the TCP4633-9822X. Also, the TMP4315-0132X submicrocomputer has been replaced with the TMP4320-6391Y. These changes cause the following differences in the functions.

(a) The capacity of the programmable timer recording function has been increased from one program per week to four programs per week.

(b) The channel selection function is modified from 12 positions to 14 positions that can be selected by Up & Down keys.

(c) The power interruption backup period has been extended from 2 seconds to 10 minutes.

(d) A wireless remote control (11 keys with 15 functions) has also been added.

(3) Functions

(a) Clock

1. 12 hour AM-PM digital clock
2. White characteristics in black background by fluorescent display tube
3. Automatic brightness selection of the fluorescent display tube (AM 6:00—PM 9:59 = Bright; PM 10:00—AM 5:59 = Dim)

(b) Program timer

1. Four programs per week
2. Daily or weekly
3. One touch timer recording (max. 5 hours)

(c) Channel selection

1. 14 positions
2. Two selection buttons by Up & Down keys (The same operation can be performed using the wireless remote control unit)

(d) Electronic counter

1. Four-digit fluorescent display tube (shared with clock display)
2. Reel rotation, pulse count system using 12 poles (magnets) and a hall element.

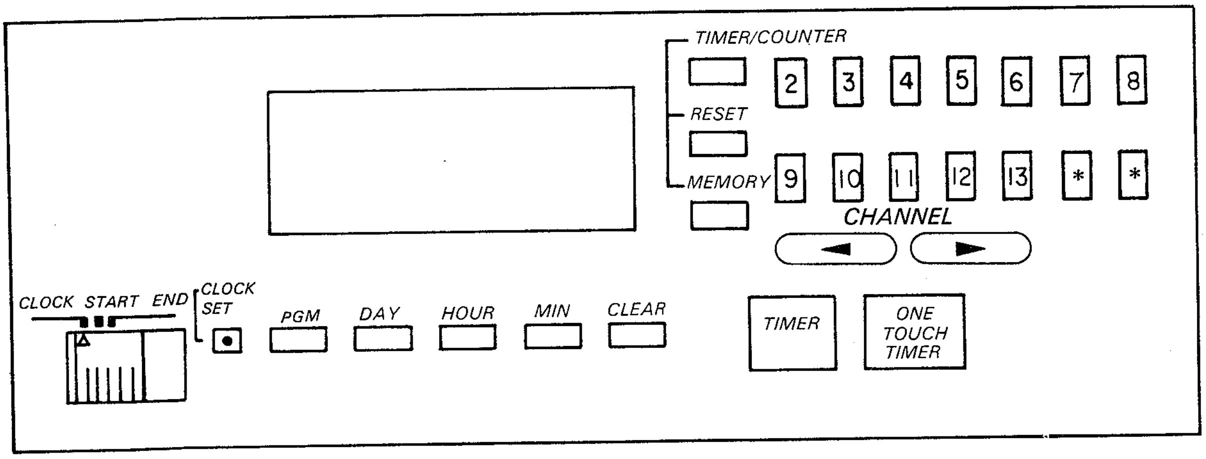

TIMER/COUNTER
RESET
MEMORY
2
3
4
5
6
7
8
9
10
11
12
13
*
*
CHANNEL
CLOCK START END
CLOCK SET
PGM
DAY
HOUR
MIN
CLEAR
TIMER
ONE TOUCH TIMER

Fig. 1-1 Timer, channel selector, electronic counter operation buttons

(4) Operation

(a) Operation keys

As shown in Figure 1-1, thirteen push-buttons and one slide switch are used to control the timer, select channels, control the counter.

(b) Clock

The AC clock signal (AC power frequency) supplied by the power transformer passes through the waveform clamping circuit (DX15) and the buffer (QX06), and is applied to pin ㉝ of timer microcomputer ICX01. The clock is synchronized with this AC clock signal.

(c) Timer

The signals at pin ① (timer mode signal), pin ② (power indication signal), and pin ③ (power ON/OFF signal) of timer microcomputer ICX01 control the logic submicrocomputer ICL01 and power system.

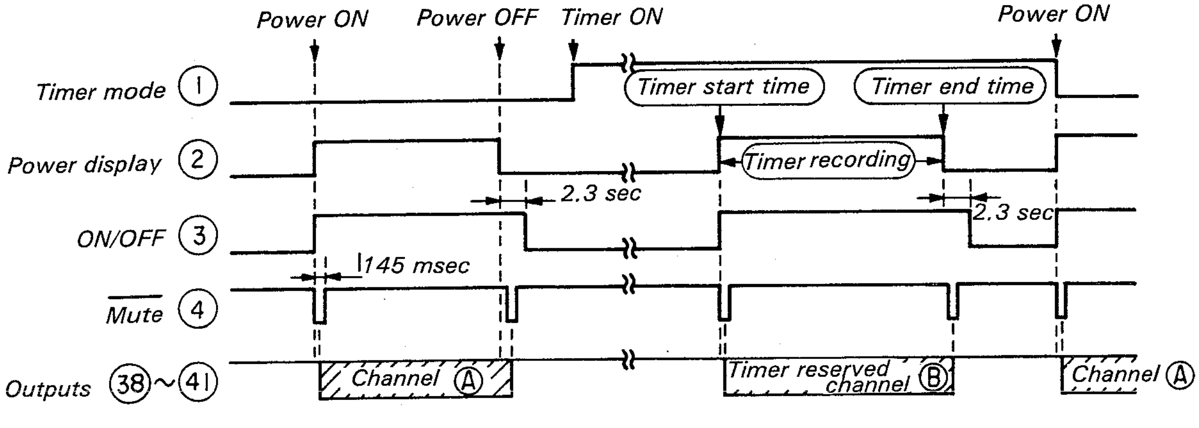

Power ON
Power OFF
Timer ON
Power ON
Timer mode ①
Power display ②
ON/OFF ③
$\overline{\text{Mute}}$ ④
Outputs ㊳~㊶
Timer start time
Timer end time
Timer recording
2.3 sec
2.3 sec
145 msec
Channel Ⓐ
Timer reserved channel Ⓑ
Channel Ⓐ

Fig. 1-2 Power supply and timer operation timing chart

(d) Channel selection

Channels are selected by performing the following routines.

- Selection keys (Operation)
- ICL01 (Key process)
- ICX01 (BCD code generation)
- PIF selector (Tuning operation)

The selected channel is displayed as follows: First, channel selection data (BCD code) from the timer microcomputer are decoded into 10 parallel signals by the decoder IC (ICA30) and light LEDs. The mute signal (AFT defeat signal) is output from the timer microcomputer while channels are being switched as shown in Figure 1-3.

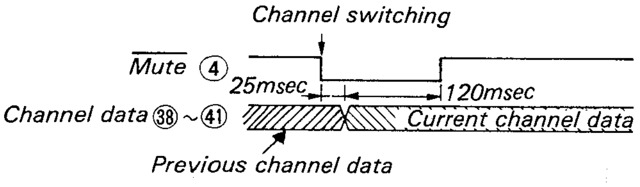


Fig. 1-3 Timing chart at channel switching

(e) Electronic counter

The counter is operated by performing the following routines.

- Take-up reel table
- Hall element (Rotation detection)
- ICL08 (Amplification)
- ICL01 (Noise elemination)
- ICX01 (Pulse count)
- Fluorescent display tube (Display)

The count direction is controlled by the Up/Down signal sent from the logic submicrocomputer.

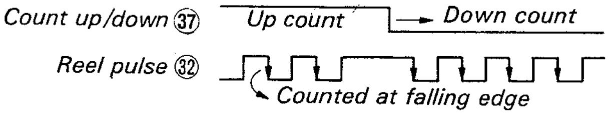


Fig. 1-4 Reel pulse count timing

(f) Fluorescent display tube

- The fluorescent display can be switched between the time, time reserved by timer, counter number, etc.
- It employs a dynamic drive system that sequentially lights up each segment based on the grid and segment pulses from the microcomputer.
- The fluorescent display tube is a kind of triode tube and lights up when both the grid voltage Ec and plate voltage Eb are +27 V with respect to the filament center voltage (−22 V).
- To extinguish the display tube, Ec or Eb must be kept at a minus 4 V with respect to the filament center voltage.

(g) Power interruption backup

Programmed information is maintained after power interruption of ten minutes or less. When a power interruption occurs, the display tube will not light. But after power is restored, the colon will flash to indicate that there was a power interruption.

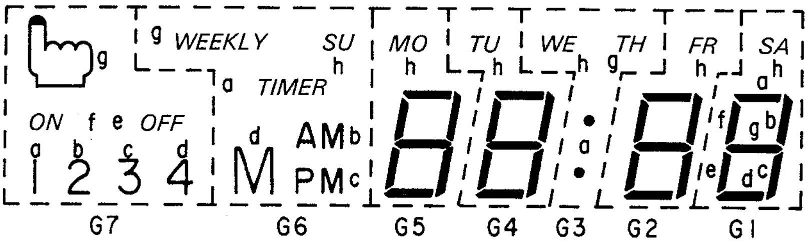


Fig. 1-5 Relationship between grids and segments of GX01

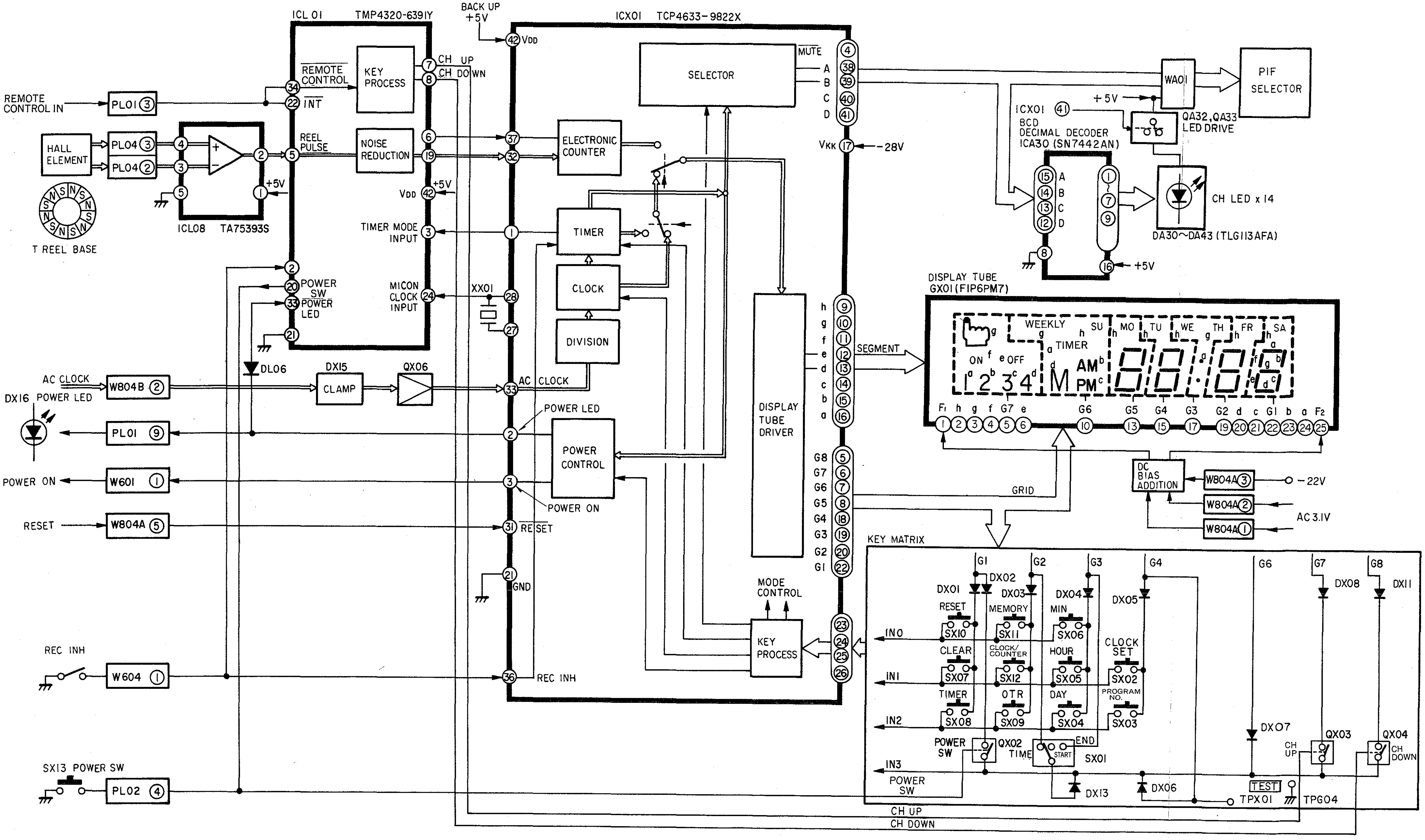

ICL 01 TMP4320-6391Y
BACK UP +5V
ICX01 TCP4633-9822X
REMOTE CONTROL IN
PL01 ③
HALL ELEMENT
PL04 ③
PL04 ②
T REEL BASE
ICL08 TA75393S
+5V
REMOTE CONTROL
INT
REEL PULSE
KEY PROCESS
NOISE REDUCTION
CH UP
CH DOWN
VDD
TIMER MODE INPUT
MICON CLOCK INPUT
POWER SW
POWER LED
XX01
SELECTOR
MUTE
A
B
C
D
VKK
-28V
ELECTRONIC COUNTER
TIMER
CLOCK
DIVISION
DISPLAY TUBE DRIVER
MODE CONTROL
KEY PROCESS
AC CLOCK
W804B ②
DX15
CLAMP
QX06
DL06
DX16 POWER LED
PL01 ⑨
POWER ON
W601 ①
RESET
W804A ⑤
POWER LED
POWER CONTROL
GND
REC INH
W604 ①
SX13 POWER SW
PL02 ④
WA01
PIF SELECTOR
+5V
ICX01 ㊶
BCD DECIMAL DECODER
ICA30 (SN7442AN)
QA32, QA33 LED DRIVE
CH LED x 14
DA30~DA43 (TLG113AFA)
DISPLAY TUBE GX01 (FIP6PM7)
SEGMENT
GRID
WEEKLY
TIMER
ON
OFF
AM
PM
SU MO TU WE TH FR SA
F1 h g f G7 e G6 G5 G4 G3 G2 d c G1 b a F2
DC BIAS ADDITION
W804A ③
W804A ②
W804A ①
-22V
AC 3.1V
KEY MATRIX
G1 G2 G3 G4 G6 G7 G8
DX01 DX02 DX03 DX04 DX05 DX07 DX08 DX11
RESET SX10
MEMORY SX11
MIN SX06
CLEAR SX07
CLOCK/COUNTER SX12
HOUR SX05
CLOCK SET SX02
TIMER SX08
OTR SX09
DAY SX04
PROGRAM NO. SX03
POWER SW
QX02 TIME
END START SX01
DX13 DX06
IN0 IN1 IN2 IN3
TEST TPX01 TPG04
CH UP QX03
CH DOWN QX04
POWER SW
CH UP
CH DOWN

Fig. 1-6 Timer, channel selector and electronic counter block diagrams

1-5 Logic Circuit

(1) Outline

The logic circuit is made up of: two microcomputers, TMP4320-6358Y for system control, which is called syscon-main, and TMP4320-6391Y for button operations, LED display, remote control process, etc. which are called syscon-sub; a servo logic power unit, which is used for system control; a timer selector unit, which is used for the LED display and to indicate the operation of each mode; and a logic switch unit. A cam system is employed in the mechanical control system to control each operation mode and a slot-in mechanism is used for tape loading. All of these mechanisms operate under the electronic logic control of the two microcomputers.

(2) Difference from V-M41

There are two differences between the V-M41 and the V-M42.

① Dew detection (Input to pin 36 of ICL01)

When a dew detection signal is input, the V-M42 stops and only accepts operation commands from the EJECT, TV/VCR, and Channel buttons. Also, if a cassette is inserted into the compartment, it will be rejected shortly thereafter.

② Counter memory stop (Counter 0000 signal is input to pin ④ of ICL01)

When counter memory is used, the V-M42 stops when the counter reads 0000.

(3) Deceleration

When the counter memory is on and the tape is rewound, the V-M42 starts decelerating when the counter reads 0299 or less. The reel motor voltage is controlled by timer counter microcomputer ICX01, which refers to the rotating speed of the take-up reel table.

The output signal at pin ㉟ of ICX01 is usually low so that Q623 is off. During deceleration, the brake pulse shown in Fig. 1-7 is output at pin ㉟. The integrated voltage derived from this brake pulse is then applied to the base of Q623, and the base potential of Q626 is lowered by the collector current of Q623, which is set by R646, so that the reel motor voltage becomes less than it usually is during rewinding.

Because the reel motor voltage is controlled by changing in base voltage of Q 623, the tape can be stopped in the exact position. When the reel motor starts to rotate, the signal at pin ⑩ of IC601 (main microcomputer) is high. Therefore, deceleration is not active.

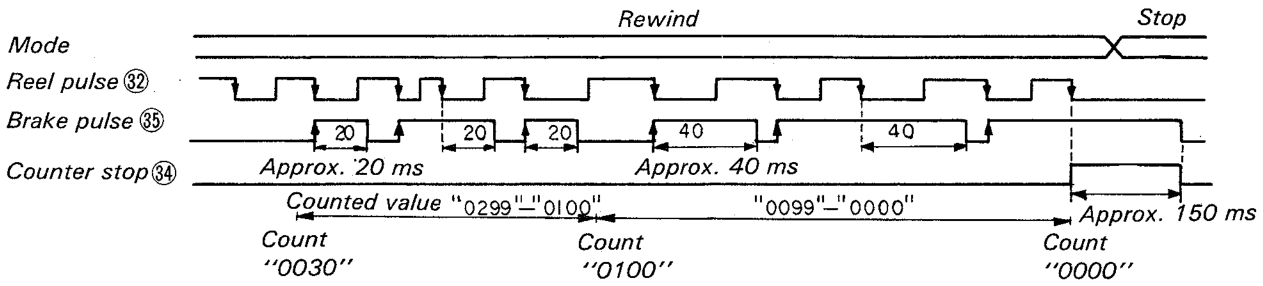


Fig. 1-7 Brake pulse output timing during operation of counter "0000" stop

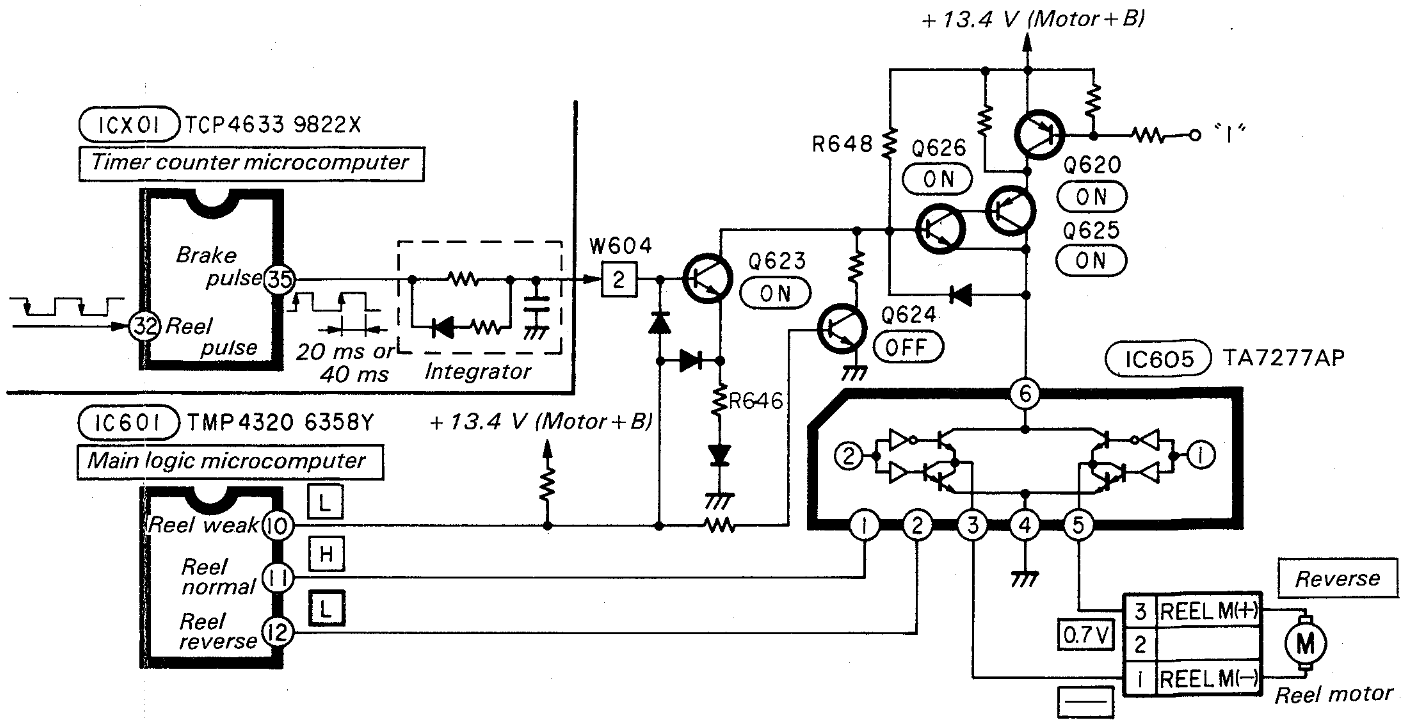

+13.4 V (Motor+B)
ICX01 TCP4633 9822X
Timer counter microcomputer
Brake pulse ㉟
㉜ Reel pulse
20 ms or 40 ms
Integrator
W604
2
Q623
ON
R648
Q626
ON
Q620
ON
Q625
ON
Q624
OFF
"I"
R646
IC601 TMP4320 6358Y
Main logic microcomputer
+13.4 V (Motor+B)
Reel weak ⑩
Reel normal ⑪
Reel reverse ⑫
L
H
L
IC605 TA7277AP
⑥
②
①
① ② ③ ④ ⑤
Reverse
0.7V
3 REEL M(+)
2
1 REEL M(–)
M
Reel motor

Fig. 1-8 Deceleration operation block diagram

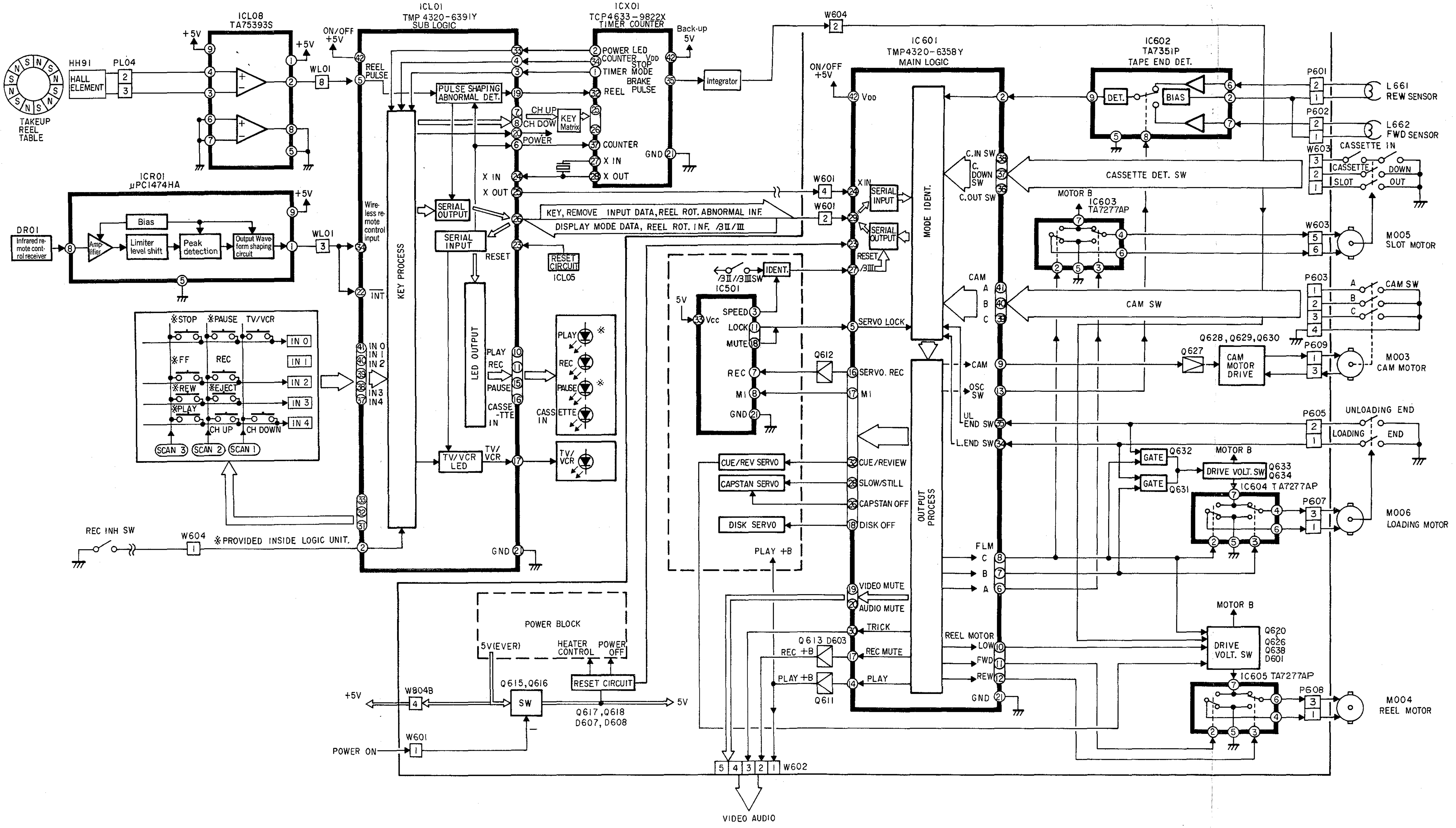

TAKEUP REEL TABLE
HH91
HALL ELEMENT
PL04
ICL08
TA75393S
+5V
WL01
ICL01
TMP 4320-6391Y
SUB LOGIC
ON/OFF +5V
REEL PULSE
PULSE SHAPING ABNORMAL DET.
KEY PROCESS
ICX01
TCP4633-9822X
TIMER COUNTER
Back-up 5V
POWER LED
COUNTER STOP
TIMER MODE
REEL BRAKE PULSE
VDD
COUNTER
X IN
X OUT
GND
CH UP
CH DOW
KEY Matrix
POWER
Integrator
ICR01
μPC1474HA
DR01
Infrared remote control receiver
Amplifier
Bias
Limiter level shift
Peak detection
Output Waveform shaping circuit
Wireless remote control input
SERIAL OUTPUT
SERIAL INPUT
RESET
RESET CIRCUIT
ICL05
KEY, REMOVE INPUT DATA, REEL ROT. ABNORMAL INF.
DISPLAY MODE DATA, REEL ROT. INF. /βII/βIII
INT
※STOP
※PAUSE
TV/VCR
※FF
REC
※REW
※EJECT
※PLAY
CH UP
CH DOWN
SCAN 3
SCAN 2
SCAN 1
IN 0
IN 1
IN 2
IN 3
IN 4
LED OUTPUT
PLAY
REC
PAUSE
CASSETTE IN
TV/VCR LED
TV/VCR
REC INH SW
W604
※PROVIDED INSIDE LOGIC UNIT.
GND
W604
IC601
TMP4320-6358Y
MAIN LOGIC
ON/OFF +5V
VDD
W601
XIN
SERIAL INPUT
SERIAL OUTPUT
RESET
/βIII
MODE IDENT.
IC501
5V
Vcc
SPEED
LOCK
MUTE
REC
MI
GND
IDENT.
/βII//βIII SW
Q612
SERVO LOCK
SERVO. REC
MI
CUE/REV SERVO
CAPSTAN SERVO
DISK SERVO
CUE/REVIEW
SLOW/STILL
CAPSTAN OFF
DISK OFF
PLAY +B
OUTPUT PROCESS
VIDEO MUTE
AUDIO MUTE
TRICK
REC MUTE
PLAY
Q613 D603
REC +B
PLAY +B
Q611
C.IN SW
C. DOWN SW
C.OUT SW
CAM A B C
CAM
OSC SW
UL END SW
L.END SW
FLM C B A
REEL MOTOR LOW
FWD
REW
GND
IC602
TA7351P
TAPE END DET.
DET.
BIAS
P601
L661 REW SENSOR
P602
L662 FWD SENSOR
W603
CASSETTE IN
CASSETTE
SLOT
DOWN
OUT
CASSETTE DET. SW
MOTOR B
IC603
TA7277AP
M005 SLOT MOTOR
P603
CAM SW
Q628, Q629, Q630
Q627
CAM MOTOR DRIVE
P609
M003 CAM MOTOR
P605
UNLOADING END
LOADING
END
GATE
Q632
Q631
MOTOR B
DRIVE VOLT. SW
Q633 Q634
IC604 TA7277AP
P607
M006 LOADING MOTOR
DRIVE VOLT. SW
Q620 Q626 Q638 D601
IC605 TA7277AP
P608
M004 REEL MOTOR
POWER BLOCK
5V(EVER)
HEATER CONTROL
POWER OFF
RESET CIRCUIT
+5V
W804B
Q615, Q616
SW
5V
Q617, Q618 D607, D608
POWER ON
W601
W602
VIDEO AUDIO

Fig. 1-9 Mechanism and system control block diagram

1-6 Wireless Remote Control Circuit

Remote control: VC-M42

(1) Outline

The VC-M42, wireless remote control unit uses infra-red ray pulse modulation. It has 11 keys and performs 15 functions to control VCRs. These are described below.

(2) Functions

VCR (11 keys)

① PLAY
② STILL
③ FF
④ REW
⑤ CUE
⑥ REVIEW
⑦ PAUSE
⑧ SLOW
⑨ STOP
⑩ REC
⑪ TV/VCR
⑫ CH UP
⑬ CH DOWN
⑭ POWER
⑮ FRAME BY FRAME

(3) Transmission circuit

Figure 1-10 is a block diagram of the transmission circuit. ICμPD1943G for VCR transmission is used in the transmission circuit.

The transmission signal is divided into two time periods: the first period, during which the transfer data code is sent and the second period and following, during which only the leader code (created while a key is pressed) is sent. The leader code and an eight-bit custom code and an eight-bit data code are transmitted during the first period. One transmission period is a total of 32 bits because the reverse of the custom and data codes are sent at the same time. The custom code varies between models (0010 0010 for VCRs). The data code is different for each transmission key.

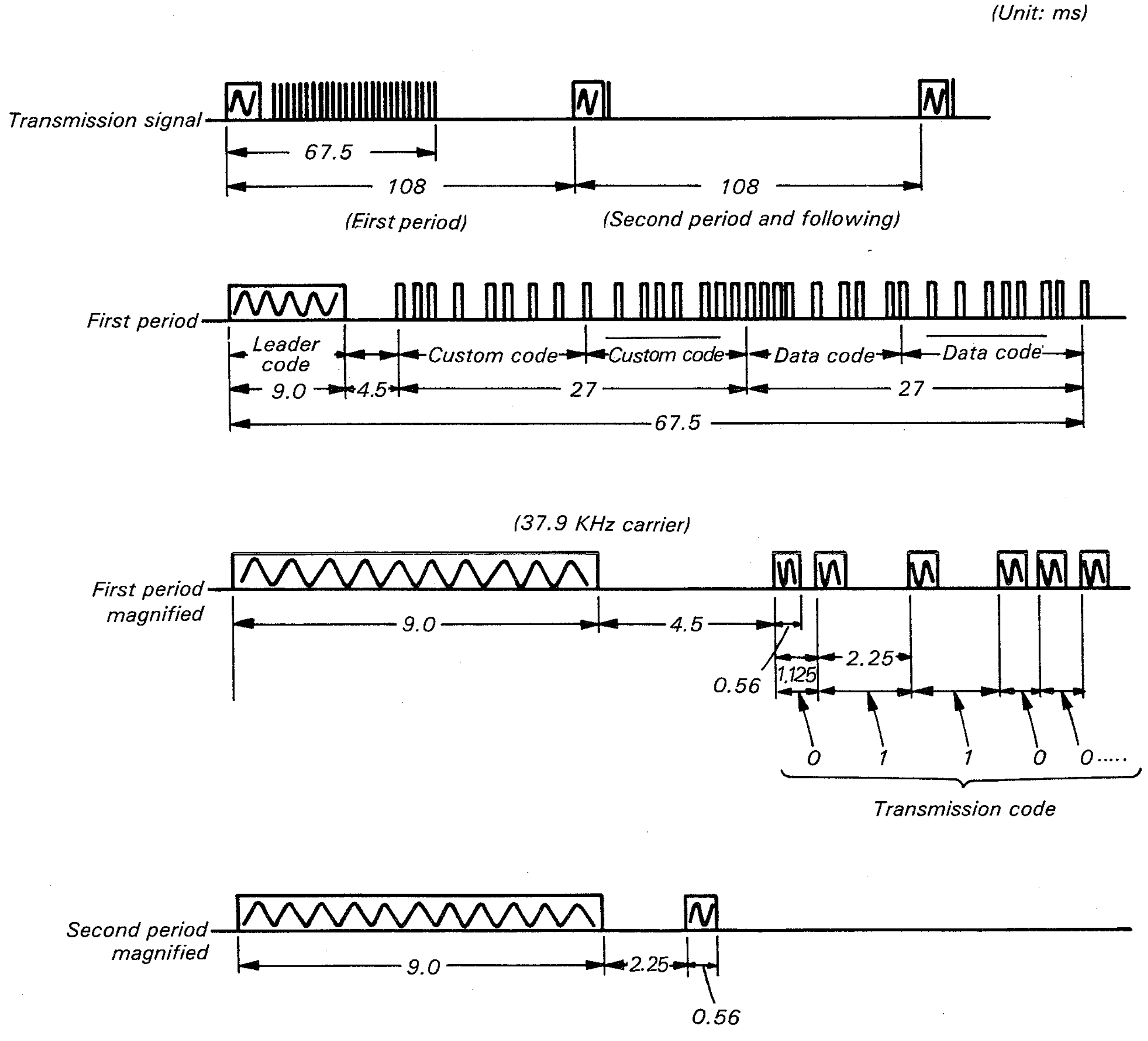

(Unit: ms)
Transmission signal
67.5
108
108
(First period)
(Second period and following)
First period
Leader code
Custom code
Custom code
Data code
Data code
9.0
4.5
27
27
67.5
(37.9 KHz carrier)
First period magnified
9.0
4.5
2.25
0.56
1.125
0
1
1
0
0.....
Transmission code
Second period magnified
9.0
2.25
0.56

Fig. 1-10 Transmission code

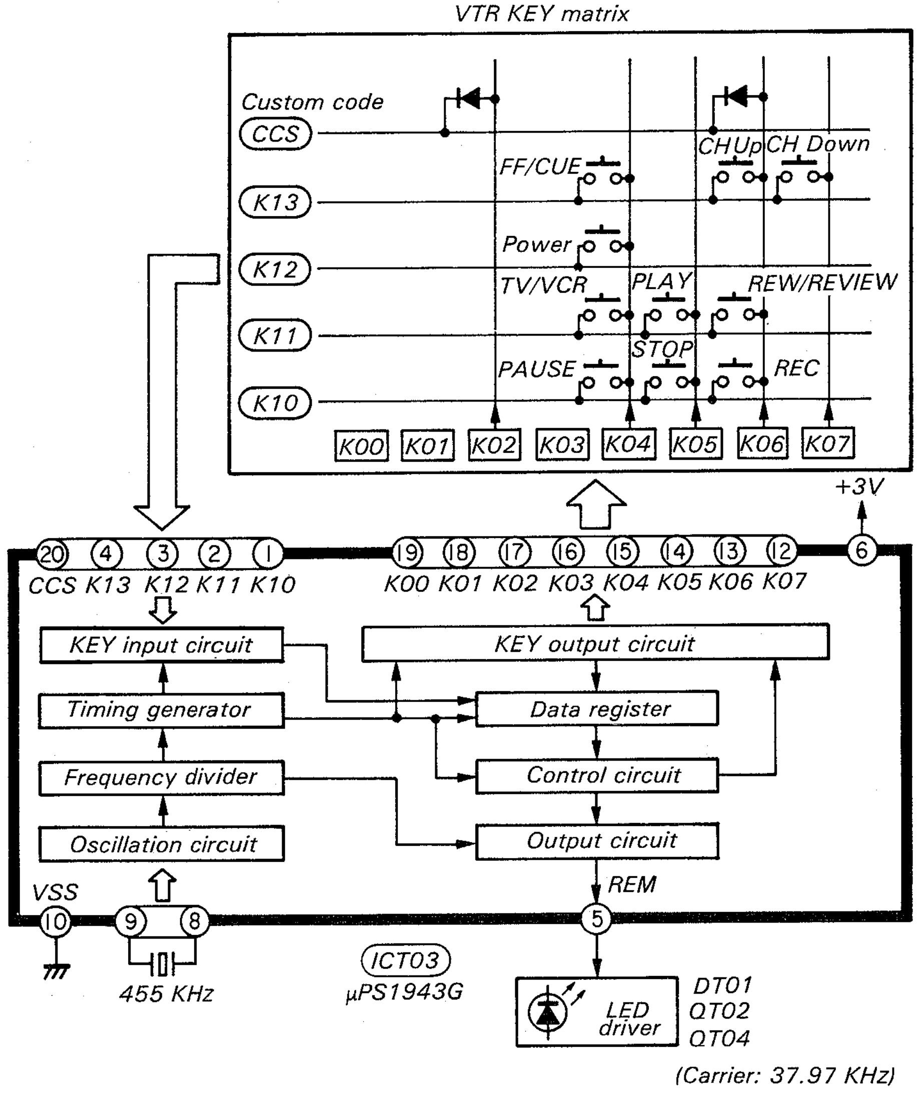
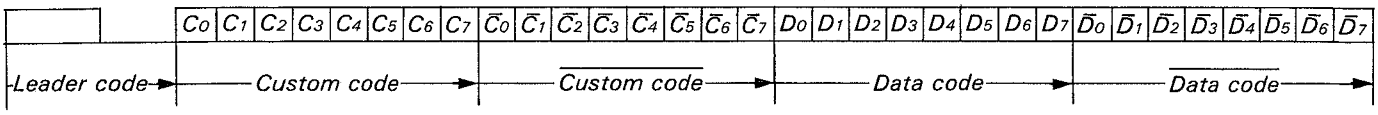

VTR KEY matrix
Custom code
CCS
K13
K12
K11
K10
FF/CUE
Power
TV/VCR
PLAY
STOP
PAUSE
CH Up
CH Down
REW/REVIEW
REC
K00
K01
K02
K03
K04
K05
K06
K07
+3V
20
4
3
2
1
19
18
17
16
15
14
13
12
6
CCS K13 K12 K11 K10
K00 K01 K02 K03 K04 K05 K06 K07
KEY input circuit
KEY output circuit
Timing generator
Data register
Frequency divider
Control circuit
Oscillation circuit
Output circuit
REM
VSS
10
9
8
5
455 KHz
ICT03
μPS1943G
LED driver
DT01
QT02
QT04
(Carrier: 37.97 KHz)

Fig. 1-11 Remote control transmission circuit block diagram

The transmission code is converted to pulse-position modulation (PPM) to identify the code.

0: Time between pulses is 1.25 ms.
1: Time between pulses is 2.25 ms.

The above transmission code used in the VC-M42 to prevent operation errors between models. The transmission codes are listed in Table 1-1.


C_0 C_1 C_2 C_3 C_4 C_5 C_6 C_7 $\bar{C}_0$ $\bar{C}_1$ $\bar{C}_2$ $\bar{C}_3$ $\bar{C}_4$ $\bar{C}_5$ $\bar{C}_6$ $\bar{C}_7$ D_0 D_1 D_2 D_3 D_4 D_5 D_6 D_7 $\bar{D}_0$ $\bar{D}_1$ $\bar{D}_2$ $\bar{D}_3$ $\bar{D}_4$ $\bar{D}_5$ $\bar{D}_6$ $\bar{D}_7$
Leader code
Custom code
$\overline{\text{Custom code}}$
Data code
$\overline{\text{Data code}}$

Function		Custom code								Data code							
		C_0	C_1	C_2	C_3	C_4	C_5	C_6	C_7	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7
VIDEO	PAUSE/STILL	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0
	TV/VCR	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0
	POWER	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0
	FF/CUE	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0
	STOP	0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0
	PLAY	0	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0
	RECORD	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0
	REW/REVIEW	0	0	1	0	0	0	1	0	1	0	0	1	1	0	0	0
	CH UP	0	0	1	0	0	0	1	0	1	1	0	1	1	0	0	0
	CH DOWN	0	0	1	0	0	0	1	0	1	1	1	1	1	0	0	0

Table 1-1 Transmission code

(4) Infra-red receiver circuit

The remote control infra-red receiver circuit detects the remote control signal by using a ICμPC1474HA receiver preamplifier, which contains a carrier amplifier, peak detector, and output waveform shaper.

Figure 1-12 illustrates the remote control infra-red receiver circuit block dagram.

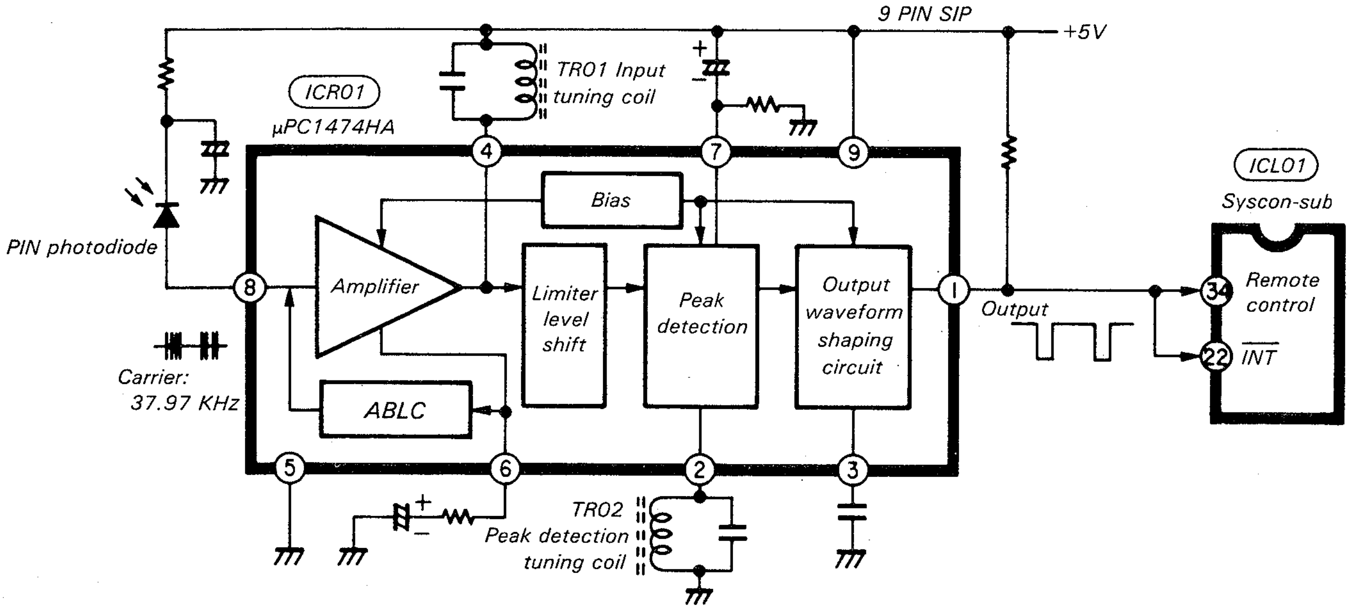

9 PIN SIP
+5V
TR01 Input tuning coil
ICR01
μPC1474HA
ICL01
Syscon-sub
PIN photodiode
Bias
Amplifier
Limiter level shift
Peak detection
Output waveform shaping circuit
Output
Remote control
INT
Carrier:
37.97 KHz
ABLC
TR02 Peak detection tuning coil
1
2
3
4
5
6
7
8
9
34
22

Fig. 1-12 Remote control infra-red receiver circuit block diagram